

THE FIRST TWO DECADES OF LIFE

A Revision and Extension of
From Infancy to Adolescence

BY FRIEDA KIEFER MERRY
AND RALPH VICKERS MERRY

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THE FIRST TWO DECADES OF LIFE· A Revision and
Extension of FROM INFANCY TO ADOLESCENCE

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To the Memory of Our Mothers
CAROLINE SCHAEFER KIEFER
and
EMMA K. VICKERS MERRY

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P R E F A C E

In the ten years which have passed since the publication of *From Infancy to Adolescence*, interest in child growth and behavior has continued to increase and an almost unbelievable amount of material in this field has accumulated. There is a tendency, also, to envisage development as a continuous process embracing larger units of time rather than to think of it in terms of shorter segments, like infancy, childhood, and adolescence.

When we undertook the revision of our earlier volume in the summer of 1947, it was our intention to bring our original content up to date and to extend it through the first twenty years. It soon became apparent, however, that the mere addition of new references and material on adolescence would not accomplish our purpose.

We found that in order to present a properly integrated picture of growth and behavior during the first two decades of life, it would be necessary practically to rewrite our first book. This has been a more arduous and time-consuming task than we had anticipated, but we hope that the results have justified our efforts.

Although it is not customary to change the title of a revised edition, such a procedure has seemed to be desirable in view of the greatly expanded nature of the present text. It is impossible to list here all the changes and additions which have been made in this revision, and we shall mention only its more salient features.

Considerably more material on physical growth has been included, and an attempt has been made to show its close relationship to behavior. An entire chapter has been devoted to social development, and the importance of socio-economic factors has received greater emphasis. Other topics which were treated in *From Infancy to Adolescence* have, in most instances, been expanded and brought up to date. We have tried, also, to give relatively equal emphasis to

the various levels of development, although we have devoted somewhat more space to the beginning of life. This is necessary in order to understand clearly the later phases of growth and behavior.

It is our hope that the present volume will be useful as a text for courses in Human Growth and Development as taught in teachers' colleges and universities. It should be equally valuable in Developmental Psychology, Child and Adolescent Psychology, and related fields.

The content is based upon the findings of scientific research from many areas, and outmoded references have been discarded for more recent ones. The excessive use of technical terms has been avoided, and when it has been necessary to introduce such terms, adequate explanation has been made. Statements which were overconcise have been amplified and expressed more simply, and an abundance of illustrative material has been given which is related, in so far as possible, to the students' everyday experiences. Many more pictures, graphs, and tables also have been included than appeared in our earlier book.

Comprehensive summaries are presented at the end of each chapter, and there is appended, also, a list of suggested activities which appeal to student interest, thus making the content more concrete. Lists of selected references are provided for each chapter, and footnote citations which are incomplete will be found in these references.

In many cases the names of publishing firms have changed over the years, and in order to avoid confusion we have used the most recent trade name. Thus, books published by D. Appleton Company, The Century Company, D. Appleton-Century Company, or F. S. Crofts are all listed as being published by Appleton-Century-Crofts, Inc.

It would be an impossibility to list all the names of individuals and publishing firms to whom we are indebted. Credit lines have been inserted for direct quotations, poems, tables, pictures, and graphs. However, these do not convey adequately our sincere appreciation for the courtesy and cooperation which we have received.

Special mention should be made of the help given to us by Mr. James Stewart on the photographic and photostatic work, and of the unfailing coöperation of Mrs. Mary Fisher Stout who again typed

the manuscript. Our thanks are due, also, to our former student, Mr. Charles De Witt, for reading considerable portions of the material and giving valuable suggestions. Finally, we wish to express our appreciation to Professor Gardner Murphy for his guidance and assistance in connection with the preparation of this revision.

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The First Two Decades of Life

C H A P T E R I

HOW WE STUDY CHILDREN AND ADOLESCENTS

THE MODERN INTEREST IN CHILDREN AND YOUTH

That we are living in an era when the public is sincerely interested in the development and guidance of children and adolescents is called to our attention daily by the press. In almost every issue there are numerous references to pamphlets, books, and magazine articles dealing with different phases of the growth and behavior of children and youth, as well as listings of the meetings of child development clubs, teen-age recreational centers, parent-teacher groups, Scouts, and other similar organizations. It is paradoxical, however, that despite all these activities adults seem to be more confused than helped. Furthermore, when definite answers are not forthcoming to specific problems which they encounter in children, parents become disgruntled and ridicule the psychologist. This idea is well illustrated in one of Galbraith's cartoons, which shows a mother with one hand poised over the lower part of her youngster's anatomy, while she is looking through a book on child psychology for the appropriate rule to apply!

Psychologists frequently receive telephone calls from excited parents who may say: "My nine-year-old Johnny is not passing in school. Tell me, what is the matter with him?" Or, "My daughter, Jenny, is in junior high school and I am so distressed because she has not as yet chosen her profession. Is there something wrong with her? Can you give her a test so that she will know exactly what job she is fitted

for?" Or it may be a teacher who inquires, "I have a child in my fourth grade with an I.Q. of 105, but he cannot read. What's the matter with him?" Another may have a very mischievous child in her group and she asks, "What would you do with him? Should I put him in the corner, or should I send him to the principal?"

Those who really understand children and adolescents know that insight into their behavior is not gained by the question-and-answer technique, or by the enumeration of specific rules for certain offenses.¹ Nor are long-distance diagnoses desirable, e.g., where the psychologist without seeing or talking to the child is expected to tell the parent exactly how to handle the situation. The modern parent or teacher needs a broad background of knowledge from a wide variety of experiences and fields of learning, and must be able to adapt them to the needs and problems of the particular child concerned.

It is the purpose of this book to summarize and evaluate some fundamental principles of human development and behavior and to show how they have been used in dealing with children and youth at different levels of maturity.

UNDERSTANDING CHILDREN DEPENDS UPON MANY FIELDS OF LEARNING

Growth and behavior are so complex that no one field of learning can give a complete understanding of them.² If we wish to gain insight into the behavior of children and youth, therefore, we must call upon many fields to aid us, such as:

Biology, genetics, and embryology
Anatomy and pediatrics
Sociology and social anthropology
Psychiatry
Psychoanalysis and mental hygiene
Psychology, and the modern teacher-education program

The science of biology, particularly *genetics*, is valuable because it helps us to understand the transmission of traits from one generation to another and the reasons why individuals in the same family

¹ L. Kanner, "Convenience and Convention in Rearing Children," *Scientific Monthly*, 1944, 59:301-306.

² R. G. Barker, J. S. Kounin, and H. F. Wright (eds.), *Child Behavior and Development*, chap. 1 by L. K. Frank.

may be similar or different in appearance and ability. In the study of the prenatal growth of both animals and humans, *embryology* has contributed greatly to our understanding of the development of behavior and its relation to structure.

From *anatomy* and *pediatrics* we learn much about the growth of body structure and its significance, e.g., such anatomical measures as height, weight, dentition, ossification, etc.

Since the early 1920's Dr. T. Wingate Todd has done much to establish norms on certain anatomical indices, such as height and weight, and has pioneered in discovering how the process of ossification, that is, the depositing of calcium in the bony structure of the body, may be used to indicate an individual's degree of anatomical maturity.

The University of Chicago also has been a pioneer in the study of osseous development. A program was started in December, 1921, using children from the Laboratory School, by T. M. Carter under the direction of Professor F. N. Freeman, and a wealth of information has stemmed from this and subsequent researches, especially those made by Charles D. Flory.

Since the founding of the Clinic of Child Development at Yale University 39 years ago, Dr. Arnold Gesell and his associates have published many books and articles summarizing around 12,000 detailed observations on the same children over a long period of time. Movies selected from these researches have proved to be exceedingly helpful in the training of pediatricians and nurses, because they show the different patterns of behavior which develop as the nervous system matures.

The Harvard Growth Studies,³ begun in 1872 and carried on to the present time by more than 200 workers, have contributed to our knowledge of physical measurements made on the same individuals annually over a long span of years. The results have clarified our thinking, especially in regard to the nature of both physical and mental growth at adolescence. The University of California's Institute of Child Welfare under the leadership of Dr. H. E. Jones and Dr. Nancy Bayley has also been studying the growth patterns of different children and youth for more than 30 years. Under the guidance of Dr. Lewis Terman and his successors, Stanford University

³ W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development*, chap. 1.

has been conducting an extensive follow-up since 1921 of the growth and characteristics of very bright children.

From *sociology* have come the studies showing how environmental forces, especially such agencies as the home, the school, and the church, have influenced the growth and behavior of children and youth, also the techniques for measuring the child's interaction with others in group situations.⁴

Social anthropology shows how differences in culture affect the behavior of children and adolescents, as exemplified in the writings of Margaret Mead;⁵ and the studies originating at Yale and Chicago⁶ have shown how caste and class influence the individual's behavior.

Psychiatry is emphasizing projective techniques⁷ in the study of the individual's personality. These include doll play, finger painting, and the interpretation of pictures, which enable the child to project himself into certain situations and to tell how he feels about them.

From *psychoanalysis* has come the concept of the importance of childhood experiences in explaining adult adjustment, and the significance of the ego in personality development.

In the past *mental hygiene* sought to deal with personality disorders, but today the emphasis is upon the prevention of such difficulties by encouraging the development of constructive habits and attitudes toward life at an early age.

Among the many contributions from the field of *psychology* are: the nature of learning; the measurement of intelligence and special aptitudes, the development and control of emotions, the development of language; the nature of the reading process; the development of play activities; and the nature, organization, and measurement of personality.

Finally, the modern *teacher-education* program is trying to synthe-

⁴ The Moreno technique was really introduced by a psychiatrist but is included under sociometric methods

⁵ *From the South Seas: Studies of Adolescence and Sex in Primitive Societies* (William Morrow and Company, Inc., New York, 1939).

⁶ A. Davis and J. Dollard, *Children of Bondage: The Personality Development of Negro Youth in the Urban South* (prepared for the American Youth Commission, American Council on Education, 744 Jackson Place, Washington, D.C., 1940), Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 34 by Davis, A. Davis and R. J. Havighurst, *Father of the Man* (Houghton Mifflin Company, Boston, 1947).

⁷ There is a vast literature of this material, which will be referred to in greater detail in Chapter 11 of this book.

size the contributions from all these different fields and is incorporating them into school activities and curriculums at appropriate levels of maturity.

WHAT METHODS ARE USED IN STUDYING CHILDREN AND ADOLESCENTS?

The intelligent student in our colleges and universities today is interested in knowing the sources and scientific validity of the data he is discussing, and in order to satisfy his curiosity we are presenting a concise résumé of the development of certain methods and techniques which have been used in studying the growth and behavior of children and adolescents.

THE BIOGRAPHICAL METHOD

In a previous publication⁸ we have pointed out our indebtedness to certain of the great educational reformers and philosophers of the eighteenth and nineteenth centuries for the beginnings of constructive interest in children. It remained, however, for a German physician and physiologist, Dr. Tiedemann, to become the real founder of "psychogenesis," or child study. In 1787 he wrote a short essay which appears to have been forgotten for many years but was revived during the nineteenth century and translated into French and English, the English title being "Consideration of the Development of Psychic Qualities in Children." This is probably the first published material on "baby biographies." It was followed by others written by eminent scholars. Two of the better-known accounts are still consulted by modern research workers. They are Wilhelm Preyer's *Die Seele des Kindes* or *The Mind of the Child*, 1882,⁹ and Miss Millicent Shinn's *The Biography of a Baby*, 1900. Dr. Preyer made systematic and meticulous observations on his son from birth through the third year, and Miss Shinn wrote a very interesting account of the observations which she made on her niece from birth through the first year of life.

Through the enthusiasm of Dr. G. Stanley Hall and his students at Clark University the organized study of infant development was launched in this country during the "gay nineties." The popularity

⁸ F. K. Merry and R. V. Merry, *From Infancy to Adolescence*, chap. 1.

⁹ W. Preyer, *Infant Mind* (translated from the German by H. W. Brown) (Appleton-Century-Crofts, Inc., New York, 1893).

of this movement was tremendous, resulting in the establishment of child study societies in 15 states. In addition child study groups were organized as a part of the program of what was called later the American Association of University Women. Journals of child study also were started as well as other similar activities both national and international in scope. Hundreds of parents, not only in the United States but also in foreign countries, became recorders of the physical and mental development of their children.

Many splendid baby biographies were published in this country and abroad between 1893 and the close of the century, when the movement was at its height. The method fell into disrepute, however, when it was used by many untrained people. This is well illustrated in the words of a distinguished educator who studied under G. Stanley Hall: "The sentimental gush and exaggeration found in popular publications naturally irritated the more conservative psychologists and educators and resulted in a reaction against the whole movement as so much froth."¹⁰ Observations were recorded in a more or less haphazard fashion, and the observer often read his own interpretation into the activity, thus unwittingly distorting the actual facts. This technique is subject to the personal bias of the writer, and it is only natural that a parent or relative would emphasize the child's better qualities and minimize his shortcomings. To base generalizations about *all* infant behavior on single cases would be unwarranted and unscientific. Furthermore, there is no way to check the material so that the results can be verified.

Mrs. Fenton's book, *A Practical Psychology of Babyhood*, 1925, is one of the last baby biographies of real merit to be published. It is a very careful and readable piece of work, covering the development of her son during the first two years of life.

The pink and blue baby books sometimes referred to as "life history albums for babies," which were developed commercially in response to the popular interest in baby biographies, are still available today, but they are more valuable sentimentally than scientifically. The first attempt to give parents a more scientific guide to the infant's development was *The Modern Baby Book and Child Development Record* by Dr. John E. Anderson and Dr. Florence L. Goodenough of the Institute of Child Welfare at the University of

¹⁰ H. D. Sheldon, "Clark University, 1897-1900," *Journal of Social Psychology*, 1946, 24:227-247.

Minnesota. Unfortunately this is now out of print. The 1934 revision is called *Your Child Year by Year: A Development Record and Guide from Birth to the 16th Year*.¹¹ A record of this type is a challenge to the intelligent parent who is actively interested in a first-hand study of child behavior and guidance. Definite questions are asked on significant facts, and brief and lucid accounts are given before each important step in development. Provision is also made for snapshots, anecdotes, and other data of special interest.

To obtain information on adolescence Hall collected diaries of the adolescent experiences of individuals who later became eminent. One of the most interesting of these is the "heart journal" kept by the writer, Louisa May Alcott, and summarized in Hall's monumental work on adolescence: "Louisa Alcott's romantic period opened at fifteen, when she began to write poetry, keep a heart journal, and wander by moonlight, and wished to be the Bettine [maid] of Emerson, in whose library she foraged; wrote him letters which were never sent; sat in a tall tree at midnight; left wild flowers on the doorstep of her master; sang Mignon's song under his window; and was refined by her choice of an idol. . . ." ¹²

In this type of autobiographical material there is a certain amount of error for, no matter how sincere the author is, it is difficult to refrain from the dramatic, easy to exaggerate probably trivial incidents and underestimate the importance of others.

Much progress in the technique of studying children occurred between the initiation of the biographical method employed in the latter half of the nineteenth century and the scientific techniques now in current use.

THE DIRECT QUESTION

In September, 1880, Dr. G. Stanley Hall, influenced by a study made in Germany in October, 1869, and with the aid of four excellent teachers, asked Boston school children either singly or by turn in small groups to reply to 123 simple questions about common things in life. They included practically every field of inquiry from nature to religion and morality. The following questions are taken at random from Hall's study:

¹¹ Sold through *Parents' Magazine*, 114 E. 32nd Street, New York, N.Y.

¹² G. Stanley Hall, *Adolescence* (Appleton-Century-Crofts, Inc., New York, 1904), Vol. I, pp. 550-551.

Have you ever seen a cow, pig, sheep, hen, bee, frog, ant, robin?
Have you ever seen apples on a tree, grapes on vines, wheat or potatoes growing?

Have you ever seen a hill, brook, woods, an island, a river?
Where does milk, butter, meat, leather, cotton, wool, come from?
Can you name three things it is right to do?
Can you name three things it is wrong to do?

If these questions failed to bring results, others were used to supplement them. The data were given in terms of percentages. This survey on *The Contents of Children's Minds on Entering School*¹³ was received enthusiastically and served as a stimulus to numerous other investigations.

In the light of modern techniques we may regard this method of direct questioning as really the forerunner of the interview which is used by some research workers today. A comparatively recent illustration of the interview technique is found in Eisenberg's study¹⁴ of the radio interests of more than 3000 New York school children in grades 5 through 8. In private friendly conferences the children were asked what radio programs they liked most during the past year, how they happened to find these programs, what other programs they liked, etc. Dimock¹⁵ also used the interview technique in his study of 200 boys between 12 and 14 years of age to gather data on such items as social activities, games and sports, and other interests.

THE QUESTIONNAIRE METHOD

The questionnaire method was also introduced by G. Stanley Hall¹⁶ and he used it to obtain information on almost every conceivable subject relating to childhood. He also sent out questionnaires to adults to obtain their reminiscences: "thoughts, feelings, ideas, and observations" of their experiences in childhood and adolescence. The great advantage of this method is the speed with which material can be gathered from widely separated geographical areas with a

¹³ E. L. Kellogg and Co., New York and Chicago, 1893

¹⁴ A. L. Eisenberg, *Children and Radio Programs: A Study of More Than Three Thousand Children in the New York Metropolitan Area* (Columbia University Press, New York, 1936)

¹⁵ H. S. Dimock, *Rediscovering the Adolescent; A Study of Personality Development in Adolescent Boys* (Association Press, New York, 1937).

¹⁶ F. K. Merry and R. V. Merry, *op. cit.*, pp. 10-11.

reasonable amount of effort. Its value, however, depends upon the skill used in formulating the questions, the people cooperating, and the interpretation and use of the data. The questions must be clear and unambiguous; the individuals answering them must be representative of all groups, so that the results will not be overweighted by replies from the more intelligent and cultured; and great care must be taken not to generalize beyond the facts given. The value of facts based upon reminiscences is also questionable, because the individual, as he grows older, tends to sentimentalize about his childhood. That is, he remembers the pleasant associations but not the unpleasant.

THE CHECK LIST

The modern substitute for the questionnaire is known as a check list. Instead of leaving blank spaces after the questions, suggested answers are given which may be checked or underlined. A certain amount of space is set aside for comments which may prove to be of value and which are not included in the check list.

THE CLINICAL METHOD

The clinical method¹⁷ of studying children was first applied in 1896 by Dr. Lightner Witmer, who conceived the idea of making intensive studies of individual children by the case history method. The term "clinical" was adapted from medical practice and really means "bedside teaching." Because of this medical connotation the suggestion has been made that the name "consulting" or "personal service psychology" be substituted. In the past, whenever a particular child was considered to be maladjusted, a specially trained individual, known as a clinician, was called upon to make a thorough study of him before diagnosing his difficulties and offering suggestions for remedial work. The modern clinical psychologist endeavors to help not only the "problem" child but the normal child as well. The clinics today lean toward the mental hygiene point of view and hence emphasize prevention, rather than remedial work, as their

¹⁷ For an historical treatment of clinical psychology, read C. M. Louttit, "The Nature of Clinical Psychology," *Psychological Bulletin*, 1939, 36.361-389. See also R. S. Woodworth, "The Future of Clinical Psychology," *Journal of Consulting Psychology*, 1937, 1:4-5. Consult also the entire issue, "Fifty Years of Clinical Psychology," *Journal of Consulting Psychology*, Jan-Feb., 1947, 11.

primary goal. This came about through the coöperation of the psychologist, psychiatrist, and social worker and their interrelationships in the clinics.¹⁸ As they became increasingly interested in the earlier and milder manifestations of behavior difficulties, it was apparent to them that if the conditions responsible for such difficulties could be recognized and corrected soon enough, most behavior disorders could be prevented. Since 1922 even their titles show this trend, the tendency being to call them "guidance clinics." In 1919 there were but 5 child guidance clinics in the United States, but by 1931 there were 83. In 1933, during the economic depression, there were 78 in operation.¹⁹ According to a survey made in May, 1946, there are now 688 mental hygiene clinics in the United States, despite the recent war and the consequent shortage of personnel. Of these 285 are for children only, but many of the others offer services to children as well as to adults.²⁰ Some clinics retain the name "child study departments," a carry-over from the influence of G. Stanley Hall's time, when they were established.

In the clinical method the examiner investigates the child's history from every possible angle in an effort to determine what experiences in the past are related to his present behavior. The value of this technique rests largely on the skill, training, and personality of the examiner and on the cooperation which he receives from the child during the examination. Much depends, also, upon the willingness of parents and teachers to carry out the suggestions made by the clinic. The time and expense which this method demands make it an almost prohibitive service unless financed by a privately endowed institution, social agency, or public school system.

Although no standardized form is used in a clinic, generally a carefully made case study includes the following items of information. (Some of these steps may be omitted, depending upon the child and the clinic.)

¹⁸ S. H. Tulchin, "Present and Future Diagnostic Role of the Clinical Psychologist," *American Journal of Orthopsychiatry*, 1942, 12:397-403. In a recent publication E. L. Kelly commends this type of teamwork, whereas C. Rogers, in the same volume, says such an arrangement is becoming outmoded. Read "Clinical Psychology" by E. L. Kelly and "Psychotherapy" by C. Rogers in W. Dennis (ed.), *Current Trends in Psychology*, pp. 75-108; 109-137.

¹⁹ See G. S. Stevenson and G. Smith, *Child Guidance Clinics* (Commonwealth Fund, New York, 1935).

²⁰ R. H. Kurtz (ed.), *Social Work Year Book* (Russell Sage Foundation, New York, 1947), pp. 318-320.

1. *Personal and Family History*

a. Facts are obtained about the physical condition, personality traits, and economic and cultural status of both maternal and paternal grandparents and parents.

b. These are supplemented by information about the number of children in the family; the child's birth order; the condition of the child at birth and the nature of his birth; the age of the parents at the time of the child's birth; seizures or spasms experienced by the child as an infant; and the attitude of parents and siblings (brothers and sisters) to this particular child.

2. *Developmental History and Physical Condition*

a. A record is made of the contagious diseases which the child has had, also accidents or serious falls.

b. The child receives a thorough physical examination, and a record is kept of his general health, sense organs (ears, eyes, nose, etc.), throat, adenoids and tonsils, glands, feet, genitalia, heart, lungs, posture, etc.

3. *Mental and Emotional Development*

a. A trained clinician makes a detailed study of the child's mental abilities, special talents, and deficiencies by means of specially constructed tests.

b. These are usually supplemented by pooled opinions of the child's intelligence as given by parents, relatives, and teachers, or by those who know him intimately and are capable of making reliable estimates.

c. The child's emotional stability may be judged by occurrences related by various members of his immediate family, relatives, teachers, or playmates, together with ratings on some of the more or less objective types of standardized scales for evaluating personality and social adjustment.

4. *School History*

The child's school progress and failures are noted, as well as his social traits. The latter are judged by his activity in play; his ability to get along with children and adults; his leadership qualities; his popularity with children; the ages and types of his companions, their interests, etc. The degree of the child's social adjustment may be judged, also, by certain sociometric techniques, such as those of Moreno and Redl.

The clinical method is not wholly scientific and is obviously subject to a certain amount of error. However, it has been of considerable value in the practical guidance of normal and problem children. The information is gathered from a number of sources (which in itself is a check), as:

1. The observation of the particular child for either a long or short period of time
2. Parental interviews
3. Home visiting and ratings
4. Teachers' judgments
5. School records and tests

The disposition of the cases depends upon the nature of the individual child and his particular problem. Further study may be necessary in some cases, or remedial work may be suggested, such as emotional reconditioning, or coaching in school deficiencies. Quite frequently placement in a foster home or in special types of school classes may be urged. Sometimes parents are using faulty methods of child training, and a visiting teacher or social service worker may be sent to consult with the home.

The modern guidance clinic is also under considerable pressure to make specific recommendations concerning the course of study which should be pursued by the high school student, and to state precisely what vocation each young person should follow.²¹ The clinician can indicate what general type of occupation the individual might succeed in by assembling information and test results concerning his mental abilities, special aptitudes, ambitions, socialization, and home background, and can supply information about various occupations. However, more than 17,000 jobs have been analyzed and classified, and this wide range of vocational possibilities, together with the variation in the pattern of individual abilities, makes it impossible to tell any person *what particular job is best for him*.

THE ANECDOTAL METHOD²²

A method which may prove to be of value to both teachers in training and teachers in service is the anecdotal record, or behavior

²¹ Tulchin, *op. cit.*, p. 400.

²² This material was obtained at a meeting of college teachers of human development in West Virginia assembled at Buckhannon, September 7, 1943. Detailed discussions of this method are published in *Helping Teachers Understand Children*, by the staff of the Division on Child Development and Teacher Personnel, *Child Growth and Development Emphases in Teacher Education*, *How Children Develop*, by the Faculty, University School, Ohio State University; and mimeographed material by S. M. Stoke, "Keeping Behavior Journals," and F. Redl, "What Should We Know About a Child?" (Stoke and Redl's materials may be obtained from the Department of Education, University of Chicago.)

journal. This method was developed largely through the efforts of Dr. Daniel Prescott and his associates at the Collaboration Center on Human Development and Education at the University of Chicago under the auspices of the Division on Child Development and Teacher Personnel, American Council on Education.

The purpose of this technique is to help the average teacher to gain a deeper understanding of child behavior so that she can offer more effective guidance in the classroom.

The first step is to have teachers write simple anecdotes about the behavior of *normal* pupils. The goal is to make these anecdotes purely descriptive, based upon objective observation of the individual in many different types of situations, such as in the school, on the playground, at home, and in various community activities. Most teachers find this very difficult to do, since they have a persistent tendency to evaluate and interpret a child's behavior on the basis of their emotional attitudes toward him rather than to report the simple facts. When this step has been accomplished, it is shown how certain behavior patterns occur over and over again. Ultimately, a teacher learns to look for the causal factors in these recurring behavior patterns. No blueprint or outline for child study is given, but rather, through skillful guidance and discussion, the teacher is led to see that the understanding of the child's personality and behavior involves a knowledge of *organic factors*, i.e., reaction to hunger, pain, energy, cleanliness, etc., *interpersonal factors*, i.e., relation of the child to his parents, brothers and sisters, peers (both boys and girls), and the teacher; and *evaluation factors*, i.e., the child's evaluation of himself and also the teacher's evaluation of him. Excellent descriptions of the use of the anecdotal record may be found in *Helping Teachers to Understand Children*.

It might seem at first that the teacher's understanding of children in general would not be greatly enhanced by the intensive study of *one* pupil. However, experience has shown that the observation of one individual actually involves comparing him with others, thus bringing into focus the developmental tasks which all children are expected to accomplish at different levels of maturity. The following excerpt illustrates the developmental tasks which society imposes upon the growing boy:

1. He is expected to be cute and beautiful, the idol of the family, from birth to two or three.

2. He is expected to keep out from under foot and give the adults a chance to take care of the new baby (this experience may come at any time from two to six in most families).

3. He is expected to sit still in school and learn to read and do numbers (beginning elementary school).

4. By his own age group he is expected to prove that he is male and independent of the grown-ups (6 to 12).

5. The girls expect him to learn to dance and look nice and drive a car (early adolescence).

6. The school expects him to throw all his energy into winning for the — High School. His parents expect him to get the best marks.

7. He is expected to find a job, either to support himself or to contribute to the expenses of college or vocational school in order to prepare for a job later.

8. He is expected by his bride to love her day and night, and by the world to concentrate his energy on "making good."²³

Although the anecdotal method can contribute greatly to the improvement of teacher-pupil relationships, certain difficulties are associated with its use. As a method it is essentially unscientific, and even though objectivity is stressed, the observations are uncontrolled, and often too much time is allowed to elapse between observing behavior and recording it, so that the facts tend to be distorted. In the present teacher-training program it is frequently difficult to make provision for each student to observe a child in a number of different situations over a sufficiently long period of time. Teachers in service who wish to use this technique may gain much insight into the behavior of children and youths. It is necessary, however, for them to have competent guidance and supervision in collecting and interpreting their data. Sometimes, too, experienced teachers find it practically impossible to be wholly objective in their observations and recording of pupil behavior. So far no scientific procedures have been devised to evaluate the effectiveness of the anecdotal approach.

THE EXPERIMENTAL METHOD

The experimental method is the most approved technique for child study at the present time. It attempts to secure typical responses of the individual under carefully controlled conditions and requires a description of the experiment sufficiently accurate and

²³ From *Experimental Social Psychology*, by G. Murphy, L. B. Murphy, and T. M. Newcomb (Harper & Brothers, New York, rev. ed., 1937), p. 327.

detailed to permit its repetition by another worker if he cares to verify the results. Instead of dealing with a single child, it involves the behavior of children in large numbers and groups.

The use of the experimental method is often dated from John B. Watson's classic experiments on the genesis of the emotions in the newborn and on young children, completed in 1920 at the Johns Hopkins University.²⁴ Before that time children, for sentimental reasons, had not been regarded as legitimate subjects for experiments.

CENTERS FOR CHILD RESEARCH

Research in the general field of child development is so extensive at the present time that a complete listing of the agencies or investigators would be impossible and impracticable. Since many of these studies are being done under the supervision of universities, or institutes connected with universities, only the names and general nature of the investigations of a few outstanding research centers will be given here. For a number of years Dr. Arnold Gesell and his collaborators at Yale University have been making extensive studies on the developmental sequences of infant behavior.²⁵ By comparing infants at one level of development with those at others, they have gradually built up behavior standards for the neonatal period; for the 4-, 6-, 9-, 12-, and 18-month levels; and at each successive age through 10 years. Their work is well known through their published research studies and also through the famous "Yale Films of Child Development." The latter deal with the behavior which is characteristic of infants—under laboratory conditions—ranging in age from 4 through 56 weeks. The "naturalistic" films show the typical behavior of babies in everyday situations. The "pediatric" films are concerned with problems of child care and were planned to meet the needs of physicians and nurses. Other films depict studies of special interests or illustrate the techniques used by the Yale Clinic of Child Development.²⁶

²⁴ J. B. Watson, "Experimental Studies on the Growth of the Emotions," in C. Murchison (ed.), *Psychologies of 1925* (Clark University, Worcester, Mass., 1926).

²⁵ Up until 1919 Dr. Gesell was primarily interested in the study of backward children.

²⁶ A. Gesell with H. Thompson and C. S. Amatruda, *An Atlas of Infant Behavior*, Vol. I (*Normative Series*), and A. Gesell with A. V. Kelher, F. L. Ilg, and J. J. Carlson, Vol. II (*Naturalistic Series*) (Yale University Press, New Haven, Conn., 1934).

The late Dr. Albert P. Weiss and his students at Ohio State University were pioneers in the scientific study of the movements of neonates and have published investigations on the senses, emotions, and learning ability of the newborn. The Bureau of Educational Research at the same university has sponsored some well-known studies on the effect of movies and radio on children.

Since the establishment of the first bureau (Child Welfare Research Station) at the State University of Iowa in 1917,²⁷ many worth-while studies have been published, especially on the motor abilities and language development of the preschool child. Special contributions of high merit have been made in the study of talents, such as in art and music, and more recently work on the newborn is in progress. Many pamphlets of much practical value have been published on a wide range of topics, including physical care, speech defects, sex training, and character and religious programs.²⁸

The Institute of Child Welfare at the State University of Minnesota has made outstanding contributions in the field of child care and training: a study of the development of language in the preschool child; an investigation of the causes and characteristics of anger outbursts in small children; longitudinal studies²⁹ on the motor, intellectual, and social development of 25 babies for the first two years; and the development of a combined verbal and non-verbal intelligence scale for the preschool level.

Among the many studies made at the Institute of Child Welfare of Columbia University are those on language development in the preschool child, the development of fears, social development, and learning; analyses of musical talent; and a survey of children's radio interests.

Dr. Nancy Bayley of the Institute of Child Welfare at the University of California has produced a splendid scale on motor development and has contributed much to our knowledge of the nature and growth of intelligence in the preschool child. Dr. Harold E. Jones of the same Institute is responsible for much of the experimental work concerning mental and physical development at ad-

²⁷ D. E. Bradbury, "The Contribution of the Child Study Movement to Child Psychology," *Psychological Bulletin*, 1937, 34:21-38.

²⁸ *Child Welfare Pamphlets*, The Iowa Child Welfare Research Station, State University of Iowa, Iowa City, Iowa.

²⁹ The same children are studied at different stages of development.

olescence reported in the *Forty-Third Yearbook* of the National Society for the Study of Education, of which he was chairman. He has published, also, one of the most scientific growth studies of an adolescent boy.³⁰

Stanford University, through the efforts of Dr. Lewis M. Terman and his co-workers, has produced the best and most widely used revision of the Binet-Simon Scale for measuring intelligence and has conducted exceptionally intensive follow-up studies of bright children.

The Catholic University of America has done much work on the standardization of infant tests of intelligence and has clarified some of our ideas on the nature and growth of intelligence during the preschool period.

Mrs. Katherine Bridges, formerly of McGill University in Montreal, has contributed one of the most thorough investigations ever made of the social development of the preschool child.

Psychologists are indebted to the workers of St. George's School for Child Study of the University of Toronto, especially to Dr. W. E. Blatz and Mrs. Helen Bott, for information on the care and training of preschool children. Under the supervision of Dr. Blatz, also, intensive studies were made on the growth and development of the Dionne quintuplets. Techniques for studying the socialization of children of the preschool period were likewise developed here.

APPARATUS AND DEVICES USED IN CHILD RESEARCH CENTERS

Movies were first used in the scientific study of children at Yale University in 1924. Since 1926 more extensive use of them has been made possible by a liberal grant for photographic research from the Laura Spelman Rockefeller Memorial. Pictures may be taken of infants at different levels of development and analyzed later.

At Yale the photographic dome is enclosed in a one-way vision screen which enables those outside to look into the dome, but they are not seen by the infant. The dome is illuminated, while the laboratory is darkened, and two silent cameras ride on the quadrants of the dome. Placed within it is an experimental crib, on the back of which

³⁰ H. E. Jones, *Development in Adolescence* (Appleton-Century-Crofts, Inc., New York, 1943).

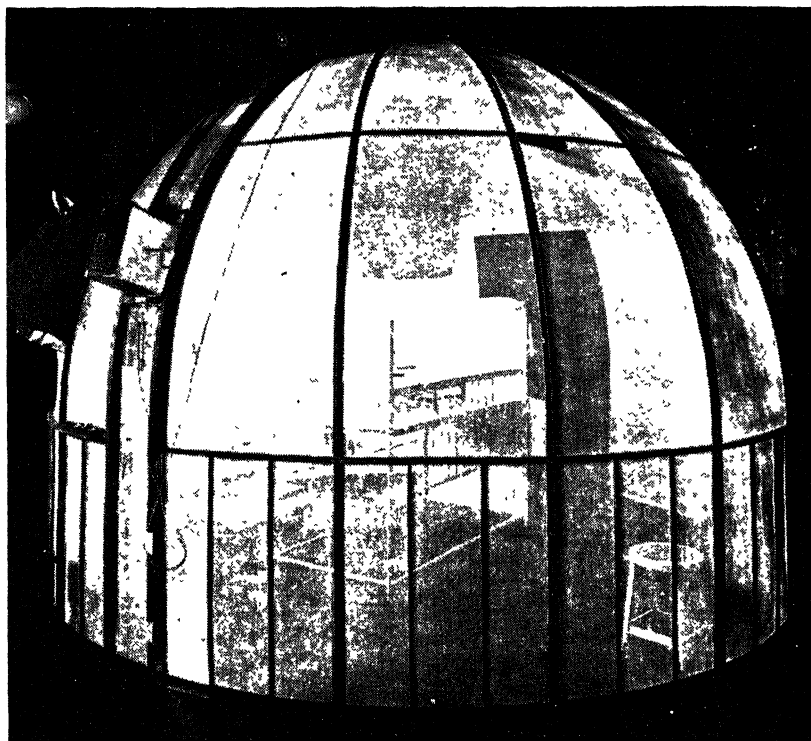


FIG 1. Photographic Dome Used at the Yale Clinic of Child Development. (Reprinted from A. Gesell and H. Thompson, *The Psychology of Early Growth*. Copyright 1938 by A. Gesell. By permission of The Macmillan Company, publishers, and A. Gesell.)

hangs a bag containing test materials. The crib can be adjusted for either sitting or lying postures. The table top, on which the objects or tests are placed, is marked off in such a way that the exact position of the materials can be described. (See Fig. 1.)

Infants are filmed not only under laboratory conditions but also in home situations. The clinic has available studio rooms, in a large home, which can be converted into various types of environments. By means of removable walls and plumbing an atmosphere can be created for sleep, feeding, bath, play, etc. Families are invited to live in these quarters for certain periods of time, while their children are scientifically observed in natural, homelike surroundings. Sound

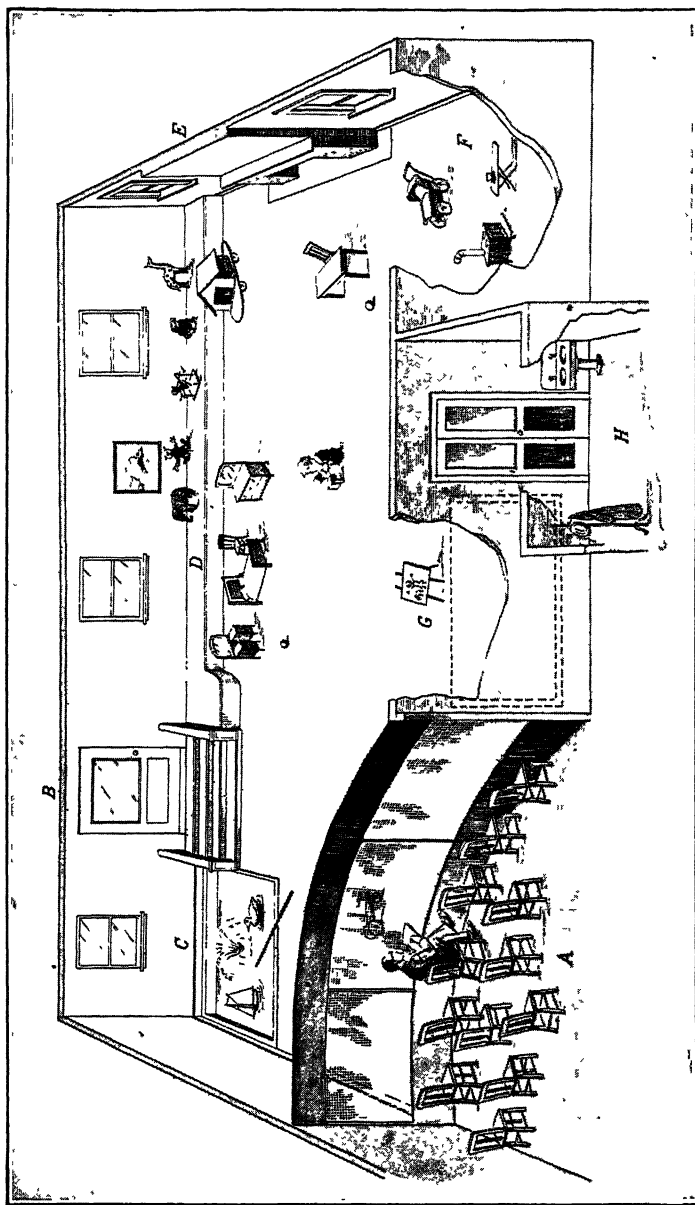


FIG. 2. Arrangement of the Yale Guidance Nursery Showing the One-Way Vision Screen.
 (Reprinted from A. Gesell, *The Guidance of Mental Growth in Infant and Child*, Copyright
 1926 by A. Gesell. By permission of The Macmillan Company, publishers and A. Gesell.)

effects are now being recorded and accurate timing devices are used.³¹

At Ohio State University elaborate apparatus was designed to observe and record the movements of newborn babies. The infant is placed in a relatively soundproof cabinet where the temperature ranges between 80 and 85 degrees Fahrenheit and the humidity is regulated. The infant is bedded upon a stabilimeter which automatically records gross movements. This is connected with a polygraph by means of which one pen records, on a strip of paper, movements in the head-foot direction, while the other pen records the movements from right to left.³² The responses are also checked by two or more carefully trained observers who have a code for recording 200 different types of movements and conditions. The record of one infant may be a mile long! (See Fig. 3.)

At Columbia, at St. George's Institute, and elsewhere, stenographic records or elaborate codes are used to record the spontaneous social behavior of nursery school children. Many other devices and types of special apparatus have been contrived in connection with experimental investigations of specific aspects of child and adolescent behavior, some of which will be described in subsequent chapters.

THE CROSS-SECTIONAL AND LONGITUDINAL APPROACHES³³

Two approaches have been used in gathering scientific data on children and adolescents: (1) the cross-sectional and (2) the longitudinal. In the cross-sectional technique data are secured from the

³¹ Gesell with Thompson and Amatruda, *op. cit.*, Gesell and Thompson, *The Psychology of Early Growth* (The Macmillan Company, New York, 1938), pp. 34-40.

³² A. P. Weiss, "The Measurement of Infant Behavior," *Psychological Review*, 1929, 36:453-471, F. C. Dockeray and W. L. Valentine, "A New Isolation Cabinet for Infant Research," *Journal of Experimental Psychology*, 1939, 24:211-214.

³³ L. Carmichael (ed.), *Manual of Child Psychology* (John Wiley and Sons, Inc., New York, 1946), chap. 1 by J. E. Anderson, C. E. Skinner and P. L. Harriman (eds.), *Child Psychology* (The Macmillan Company, New York, 1941), chap. 1 by Skinner and Harriman; Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 1 by L. K. Frank, A. Gesell and F. L. Ilg, *Infant and Child in the Culture of Today* (Harper & Brothers, New York, 1943), and *The Child from Five to Ten* (Harper & Brothers, New York, 1946); W. W. Brickman, "Educational Literature Review. Psychology of Adolescence," *School and Society*, 1946, 64: 225-231, and "Child Psychology," *School and Society*, 1947, 66:328-334.

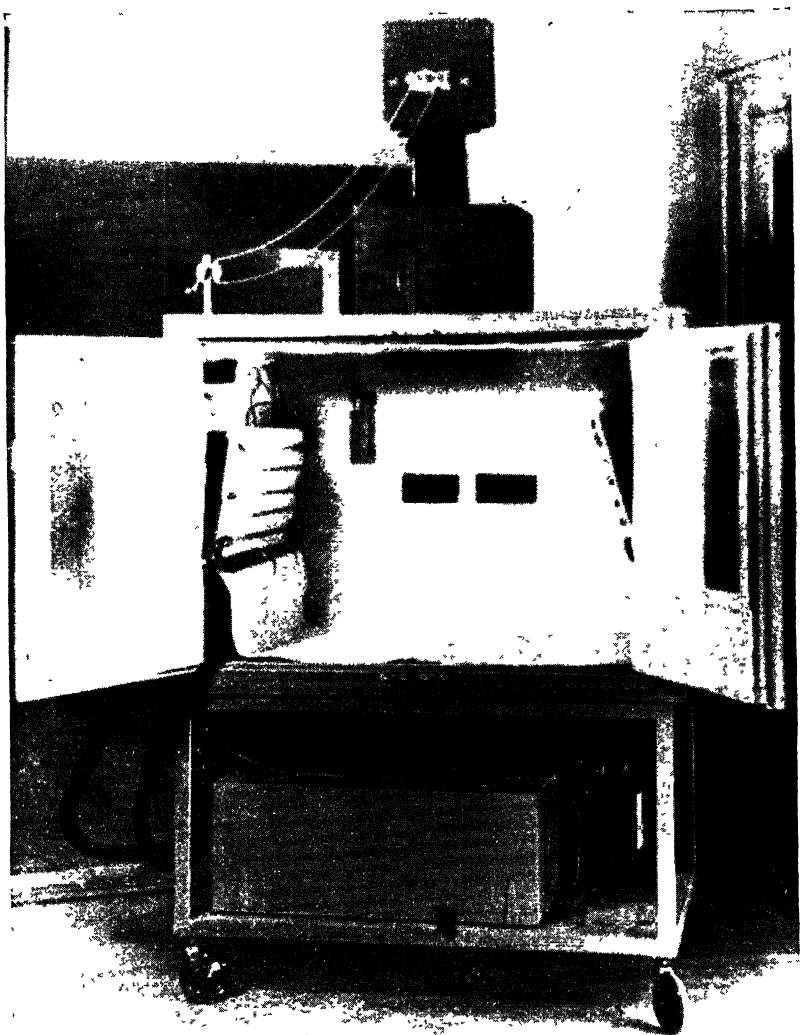


FIG 3. Isolation Cabinet Used at Ohio State University. (Reprinted by permission of the late Professor F. C. Dockeray and the Department of Psychology, Ohio State University.)

observations and measurements of large numbers of individuals at various age levels. Standards for each age are then derived by averaging the results obtained. Although this permits comparison of the person with the characteristics of his age group, it obscures individual differences. For instance, according to the height-weight tables often consulted by parents and school nurses, a ten-year-old boy should be 47 inches tall and weigh between 48 and 58 pounds.³⁴ Such standards can only be approximate, and no one need be alarmed if the child does not conform to them, because individual factors, such as family stock and nutritional status, are not taken into account. The longitudinal approach accumulates a large number of observations and measurements of the same individual, or a small group of individuals, over a period of years. Thus, the measurements of height and weight may be taken at frequent intervals on the same child from birth to maturity and his developmental status interpreted on the basis of his own growth curve. Where a group of individuals is studied in this way, characteristic patterns emerge, which are common at various levels of development. However, certain errors arise in the use of this technique. If the original sampling of cases is not chosen with great care, the future of the study is jeopardized. If the parents of the children fail to cooperate, or if the families move away, the remaining sampling may be too small upon which to base valid generalizations. Furthermore, if a study is continued over a period of years, inaccuracies may result from the introduction of different workers from time to time and also from changes in the observation and recording devices. Despite these criticisms the present trend is toward an increasing use of the longitudinal approach in studying children and adolescents.

UNDERSTANDING THE WHOLE INDIVIDUAL

After considering the various methods discussed in this chapter, the question naturally arises as to which technique is to be used. As has been indicated, some methods at the present time are outmoded and have been superseded by others. In the final analysis, however, the procedures to be employed will depend upon the age of the individuals involved and the conditions under which the investigation is to be carried on, that is, whether in the laboratory, on the playground, at home, or in the school.

³⁴ P. L. Boynton, *Psychology of Child Development* (Educational Publishers, Inc., Minneapolis, 1938), p. 108.

In this book, growth will be discussed from conception through the first two decades. Naturally, it would be difficult to explain all phases of development simultaneously, and its division into a number of separate aspects is admittedly somewhat artificial. For example, the child does not grow physically one day and emotionally and socially the next, but all these phases proceed at the same time.

We shall first consider the child's hereditary background, conception, and prenatal development. Then we shall discuss the various phases of development from birth to early maturity.

It is our hope that this treatment will enable the student to understand that growth is continuous and that certain fundamental patterns of behavior are common at different stages of development although some individuals may experience these patterns sooner or later than others. We trust, also, that the reader will gain some understanding of the tasks involved in growing up in our modern American culture and will know what to expect of children and young people. Finally, it is hoped that the reader will come to understand the point of view of children and adolescents and will genuinely enjoy his contacts with them.

SUMMARY

At the present time there is widespread interest in the problems of children and adolescents, although some adults mistakenly suppose that ready-made solutions can be supplied for them.

The problems of development are so complex that a multi-discipline approach is used today, including contributions from the fields of: biology, genetics, and embryology; anatomy and pediatrics; sociology and social anthropology; psychiatry, psychoanalysis, and mental hygiene; psychology and education.

There are many ways of studying the developing individual, and one of the oldest is the biographical method, wherein records are kept usually from birth to the end of the first, second, or third year.

Autobiographies and diaries of adolescents have also been studied and have yielded some interesting but not wholly trustworthy data.

Much information, also, has been obtained through the use of direct questions, interviews, and questionnaires. These have been replaced to some extent by the check list, which seeks to remedy the shortcomings of the questionnaire.

The clinical method, when used by competent workers, often yields practical results because of its comprehensive nature. How-

ever, it requires a great deal of skill and is expensive and time-consuming.

Anecdotal records may be of value in helping teachers to understand children but are subject to some error and have not as yet been evaluated scientifically.

The objective approach to the study of children and adolescents was delayed because of the belief that the former should not be used for experiments. With the overcoming of this prejudice, however, the experimental technique has become widely adopted and tremendous progress is being made, particularly in the research centers sponsored by the large universities.

Within recent years the longitudinal approach has been preferred to the cross-sectional technique, because the latter obscures individual differences.

There is no one best method to be used in studying development; the procedure employed will be determined in large measure by the problem investigated.

The point of view followed in this book emphasizes the continuity of growth, although for purposes of clarity various phases of development are considered separately.

It is the hope of the authors that the reader may gain some knowledge and understanding of the personalities of young people within the first two decades of life.

SUGGESTED ACTIVITIES

1. Find and report upon some evidence in the daily press or current magazines of adult misconceptions about child psychology.
2. If you have a baby book on yourself or can secure one on someone else, examine it carefully and note the contents.
3. If you kept a diary or an autograph book during adolescence, classify the themes and topics occurring most frequently.
4. Write two or three anecdotes describing the behavior of some child or adolescent. Bring these to class and discuss them from the standpoint of their accuracy and objectivity.
5. If your college or university makes it possible for you to see any child development films, report on the number of techniques which you can identify.

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CHAPTER 2

HOW WE BEGIN LIFE

HOW DO HEREDITY AND ENVIRONMENT INFLUENCE DEVELOPMENT?

From the time of Plato and Aristotle there has been heated discussion as to the relative importance of heredity and environment in accounting for individual differences in people. Heredity may be defined as "the influence of the different materials with which different individuals begin life," while environment refers to "the influence of the way these materials are treated, the conditions to which they are subjected."¹ Until recent years the tendency was to regard these two forces as separate and distinct, heredity operating before birth, environment after birth. It was not uncommon for college classes to debate such questions as: "Which is more important, heredity or environment?" Usually the decision depended upon which of these two factors received more emphasis in the classroom!

That heredity plays an indispensable role in the origin and development of the human individual cannot be denied. Biologically, we must all start from the fusion of two cells and, as we shall see, the nature of those cells will influence, to an important extent, the course of our future development. It is equally futile to deny that the environmental factors surrounding the developing individual will be of tremendous significance. Hence the old heredity-environment controversy is, in reality, a mere academic and somewhat pointless argument.² From the genetic point of view it is not a question of

¹ H. S. Jennings, *Genetics*, p. 4.

² L. R. Dice, "The Importance of Cooperative Studies of the Biology of Man," *Science*, 1944, 99:457-461.

heredity *or* environment, but rather one of heredity *with* environment. As one writer says, the two are "integrally related" and function together in the growth process.

It must be remembered that an individual's life begins at conception and that the combined influences of heredity and environment operate from that time. The fertilized cell from which the new individual develops may contain many hereditary factors, but in order for these to exert their full effect, proper conditions of food, oxygen, water, and normal temperature must prevail.³ A pronounced variation in any one of these conditions may greatly affect the development of the organism. This is shown clearly in experiments with lower life forms. For example, if the eggs of minnows are hatched in sea water in which there is an excess of magnesium chloride, the fish frequently develop one eye instead of two, and the position of the single eye may vary.⁴ A species of salamander, also, may change from an amphibious creature to a land animal unable to swim, if certain environmental alterations are introduced during its development. The extreme effects of early environmental changes are not so marked in mammals (so called because they suckle their young), since they grow within the mother's body where conditions are relatively uniform. Nevertheless, some abnormality in the environment may occur which can affect the structure of the developing organism. Thus, if a child is born with an incomplete arm, it may be because of defective inheritance or because growth was inhibited by pressure from the umbilical cord. It has been shown, also, that a certain eye defect in prematurely born infants, which produces blindness, is caused essentially by environmental changes.⁵ Nor do the effects of inheritance cease after conception; they are said to continue their influence until death. Even longevity may be determined by inherited factors.⁶ Obviously, too, environment continues to operate throughout a person's life span, and many traits and characteristics formerly believed to be hereditary have been experimentally modified by changes in environment.

³ J. S. Gray (ed.), *Psychology in Human Affairs* (McGraw-Hill Book Company, Inc., New York, 1946), chap. 3.

⁴ A. Anastasi, *Differential Psychology*, pp. 71-74; and G. W. Corner, *Ourselves Unborn*, pp. 85-86.

⁵ T. L. Terry, "A Visual Defect in the Prematurely Born Infant," *Outlook for the Blind and the Teachers Forum*, 1945, 39:211-213

⁶ A. Scheinfeld, *You and Heredity*, chap. 25.

We ordinarily think of the songs of birds as being characteristic of a particular species and relatively unaffected by environment. Experiments have shown, however, that canaries can be taught to whistle tunes like "Yankee Doodle," "Pop Goes the Weasel," "Hail, Hail, the Gang's All Here," and "Holy Night, Silent Night." Other birds also show variations in their songs if they are reared either in isolation or with other species. However, some limitation in range and complexity exists, and birds cannot learn tunes involving demands beyond their structural possibilities. The birds also tend to show a characteristic song pattern regardless of the tune reproduced. Thus, "Holy Night, Silent Night" and "Yankee Doodle" are whistled at about the same tempo!⁷

Among humans the cases of children reared by animals are frequently cited as proof of the importance of environmental influences upon structure. The girls, Amala and Kamala,⁸ said to have been reared by wolves and discovered by a missionary in India, showed many of the characteristics of wolves when first captured. They ran on all fours, ate raw meat, and howled during the night. Amala, the younger, died in a short time, but Kamala lived for eight years. She learned to speak about 40 words, looked after some of the children in the orphanage, and acquired many human modes of behavior, but never became fully normal. Although some doubt has been cast upon the authenticity of this and other accounts of wolf children,⁹ it cannot be denied that to be deprived of human contacts and normal socialization during early childhood would seriously retard development.¹⁰ This is shown in the following incident which occurred in Pennsylvania:

Nine-year old Alice — has lost her long battle for the health and happiness denied her when she was kept a virtual prisoner in a dingy farmhouse attic for the first five years of her life.

⁷ R. W. Husband, *General Psychology* (Rinehart and Company, Inc., New York, 1940), pp. 36-37; also M. Metfessel, "Relationships of Heredity and Environment in Behavior," *Journal of Psychology*, 1940, 10:177-198.

⁸ A. Gesell, *Wolf Child and Human Child* (Harper & Brothers, New York, 1940-41).

⁹ D. G. Mandelbaum, "Wolf-Child Histories from India," *Journal of Social Psychology*, 1943, 17:25-44.

¹⁰ J. M. G. Itard, *The Wild Boy of Aveyron* (translated by G. and M. Humphrey) (Appleton-Century-Crofts, Inc., New York, 1932); and J. P. Foley, Jr., "A Further Note on the Baboon Boy of South Africa," *Journal of Psychology*, 1940, 10:323-326.

— County authorities were notified that the little, auburn-haired girl died at a school in M—, Pa., where she had learned to walk, talk, and eat solid foods—things unknown to the child when the county obtained custody of her four years ago.

In February, 1938, humane society agents found Alice, emaciated and crippled by rickets, in the attic of the house where she lived with her unmarried mother and her grandfather. The mother said she kept Alice in the attic because the grandfather did not wish to see her.

The child at that time weighed 31½ pounds, 20 pounds below normal. She had been fed only from a bottle and nipple.

The county placed Alice in the boarding home of Mrs. J. R. here. She learned to chew solid food and to totter about on once spindly legs.

Alice was chattering in the gibberish of a 16-months-old baby when the county transferred her to the M— school. There she was learning the habits of normal children until pneumonia caused her death.¹¹

Another interesting question is the degree to which animals can develop human characteristics if brought up in a human environment. The Kelloggs' experiment¹² in rearing a 7½-month-old chimpanzee, Gua, with their 10-month-old son, Donald, demonstrates what can be accomplished in this respect. During the nine months of the experiment, Gua learned to wear clothes, to sleep in a bed, to drink from a cup, and to handle a spoon. She could understand simple commands and had a meaning vocabulary of 50 words. Limitations of structure, however, apparently made it impossible for her to acquire active human speech.

It may be concluded from the foregoing that although environment is an indispensable element in normal development, structural factors are equally important. We must remember that biological structure is not a fixed quantity but is constantly changing in accordance with some definite growth potential. Some behavior, therefore, results from the natural development or maturation of the organism. Wide variations in the conditions under which growth takes place will influence this process of maturation, but its general pattern is fairly consistent for different species. Thus, in the case of Amala and Kamala, although the animal environment in which they were reared prevented them from becoming normal humans, they did have hu-

¹¹ From the Charleston, West Virginia, *Daily Mail* for August 8, 1942.

¹² W. N. Kellogg and L. A. Kellogg, *The Ape and the Child: A Study of Environmental Influence upon Early Behavior* (Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1933).

man structure and because of this they were able to attain a level of human behavior which no animal could approximate. We cannot say that the structural factors are solely the result of heredity. However, the influence of inheritance upon structure is so great that we must outline its mechanism briefly and consider its general scope with regard to individual development. In subsequent chapters we shall stress the importance of both maturational and environmental or acculturational influences upon the individual during the first two decades. Now we shall turn to a consideration of how life begins.

HOW HUMANS REPRODUCE¹³

In order to understand the way in which life is transmitted from one generation to another it is necessary to know a few of the essential facts about the reproductive organs of the mature male and female. These are illustrated in the accompanying diagrams.

The mature female reproductive organs consist of two ovaries (which produce the egg cells) and two tubes, known as the Fallopian tubes, connecting the ovaries with the pear-shaped uterus or womb. The uterus, in turn, opens into the vagina through the cervix. The male reproductive system includes two testicles, each containing hundreds of feet of coiled tubes within which the sperm cells are produced. These sperm cells are then carried through a duct (ductus deferens) and stored in the seminal vesicles. During sexual intercourse seminal fluid containing live sperms is discharged by the penis into the vagina of the female.

Billions of sperms are developed by the male during his reproductive life, and it has been estimated that as many as 200 million may be present in a single ejaculation of seminal fluid. Only one sperm, however, is required to fertilize an egg cell, and nature seems to have provided such tremendous odds to compensate partly for the fact that sperms die rather easily.

During her mature life the female may produce about 400 ova or egg cells. Ordinarily only one egg is developed in one of the ovaries every 28 days, although occasionally two egg cells may be available for fertilization at the same time. The egg cell, or ovum, passes

¹³ E. V. Clapp, *Growing Up in the World Today* (The Massachusetts Society for Social Hygiene, Boston, 1946); also the pamphlet published by the State Department of Health, *We Grow Up* (Charleston, West Virginia, n.d.); also A. F. Guttmacher, *The Story of Human Birth* (Penguin Books, Inc., New York, 1947).

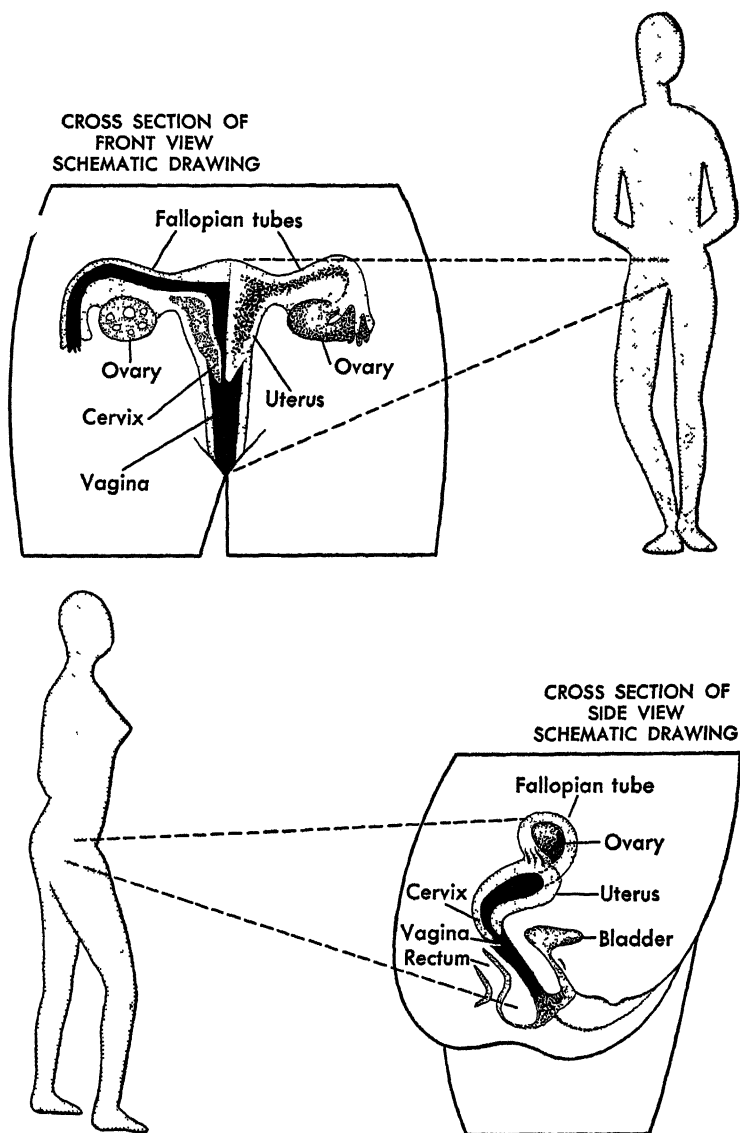


FIG. 4. Schematic Drawing Showing Front and Side Views of the Female Reproductive System. (Reprinted from *We Grow Up* by J. L. Kaukonen. By permission of the West Virginia State Department of Health.)

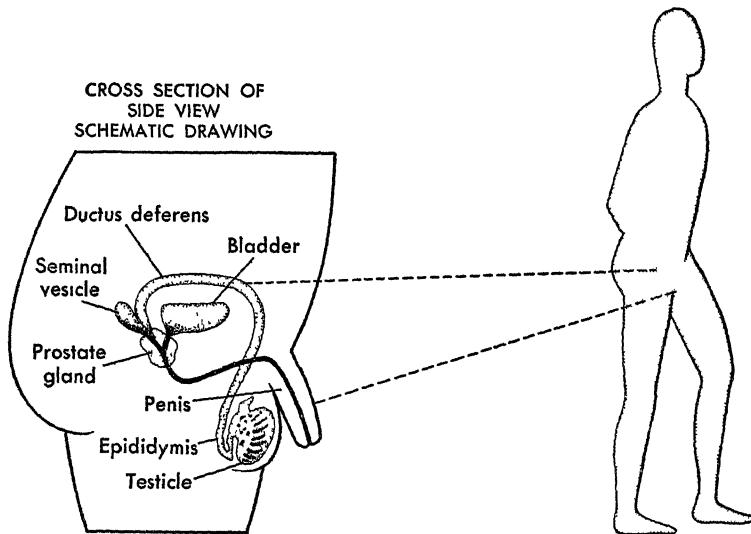


FIG. 5. Schematic Drawing Showing Side View of the Male Reproductive System. (Reprinted from *We Grow Up* by J. L. Kaukonen. By permission of the West Virginia State Department of Health.)

through the wall of the ovary and is carried down a Fallopian tube toward the uterus by the rhythmic motion of fine hairlike structures which line the tubes. The uterus prepares to receive the egg cell by concentrating a generous blood supply in its inner tissues, so that if the egg is fertilized adequate nourishment will be available for it. If, however, fertilization does not take place, the lining of the uterus breaks down and passes off as menstruation.

The ovum has no power of locomotion, but the sperm has a motile tail, enabling it to swim through the cervix, into the uterus and on into the Fallopian tube where, in the process of fertilization, it unites with the egg cell. In this fusion the tail of the sperm drops off, and its head, containing the nucleus, buries itself in the ovum. Normally, the fertilized egg cell continues its journey down the tube and remains in the uterus where it develops into a new individual and is finally expelled through the vagina at birth.

HOW HEREDITY WORKS

Human heredity is a highly complex process, many aspects of which are not yet clearly understood. We have seen that conception

is the fusion of a male reproductive cell, the sperm, with a female reproductive cell, the ovum. In each of these cells there is a nucleus containing threadlike bodies known as chromosomes, so called because they absorb color and therefore can be seen under a high-powered microscope. The number and size of these chromosomes vary widely with different species. For example, a worm has 4 large chromosomes, the fly has 8 extremely small ones, the grasshopper has 23 fairly large ones, and man has 48 very small chromosomes.¹⁴ In each human reproductive cell the chromosomes are arranged in 24 pairs, each member of the pair being identical in size and structure, with a single exception which we shall consider presently. It can readily be seen that if all the chromosomes in the sperm and ovum entered into the process of conception their number eventually would reach infinity. To hold the number of chromosomes constant, nature has provided an interesting device. Before the sperm and ovum unite, each passes through a ripening stage wherein what is known as reduction division occurs. In this process half of the chromosomes in each cell are dropped, so that when conception occurs only 24 chromosomes are contributed by each parent cell, and thus the new individual maintains the 48 chromosomes characteristic of the human species.

The question of *which* chromosomes are dropped prior to conception seems to be largely a matter of chance. Hence, it is extremely unlikely that any two conceptions would involve exactly the same chromosomes.

Furthermore, the mechanism of heredity is made much more complex by the fact that each chromosome contains hundreds of much smaller bodies called genes. Until recently these could not be seen even under the electron microscope,¹⁵ but particles thought to be genes have now been identified. We know, however, that genes must exist because of the way in which traits are transmitted. Genes are the *real* carriers of hereditary characteristics, for their number and combination are known to be responsible for the different kinds and rates of growth that occur in the developmental history of the individual. In other words, it is the genes which appear to determine

¹⁴ T. H. Morgan, *The Scientific Basis of Evolution*, pp. 24-25

¹⁵ J. T. Buchholz, "Chromosome Structure Under the Electron Microscope," *Science*, 1947, 105:607-610, D. C. Pease and R. F. Baker, "Preliminary Investigations of Chromosomes and Genes with the Electron Microscope," *Science*, 1949, 109:8-10, 22.

THE HEREDITY PROCESS

EVERY MAN and EVERY WOMAN

At conception received
24 Chromosomes from each parent
or 48 in all

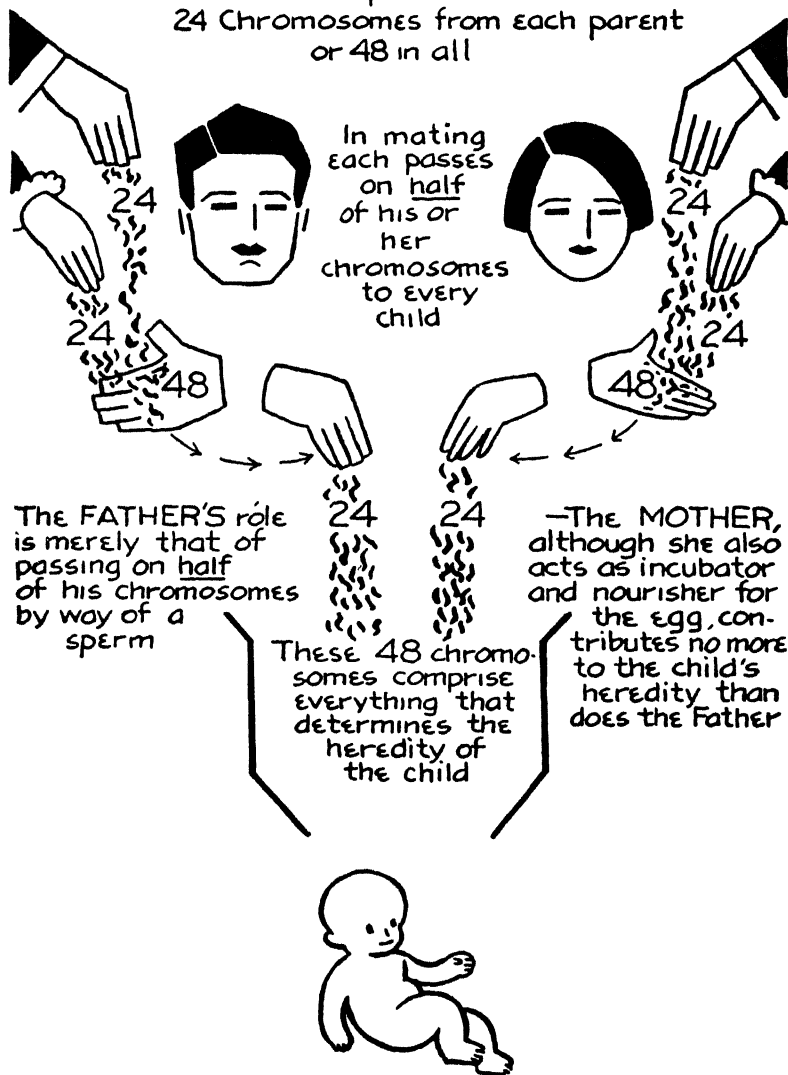


FIG. 6. The Heredity Process. (From *You and Heredity*, copyright 1939, by Amram Scheinfeld. Published by J. B. Lippincott Company.)

the maturational pattern for each person. This pattern is similar to some extent for all *human* beings because they all have *human* genes. It differs from individual to individual largely because of variations in gene organization. Thus, children of the same parents tend to be more like one another than like other children, because their genes, while not identical, are somewhat similar since they have been selected from the available genes of both parents. Moreover, it should be pointed out that the wide individual differences observable among brothers and sisters may be due largely to the almost infinite possibilities of gene organization which they may receive.

Presumably, the only instance wherein two individuals would possess identical sets of genes would be that of identical or "true" twins, which will be discussed later.

HOW SEX IS DETERMINED

Many theories and superstitions have existed regarding the sex of the unborn. Numerous examples may be found in the folklore of all peoples of attempts by prospective parents to influence the sex of their offspring. Thus, it has been said that if a bridegroom went to bed with his boots on, a boy would be conceived; or if a woman ate large amounts of sugar, she would give birth to a sweet girl.¹⁶ We now know that sex is determined at the moment of conception by the arrangement of the chromosomes and is uninfluenced by any external means.

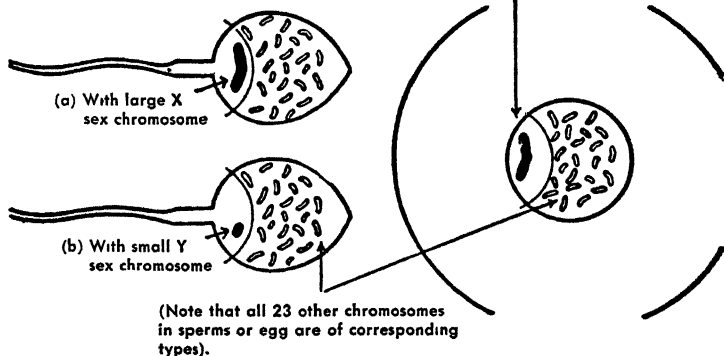
As mentioned above there is an exception to the 24 pairs of identical chromosomes in each reproductive cell. Twenty-four pairs of identical chromosomes, called *x* chromosomes, are present in the female cell, while the male has 23 pairs of *x* chromosomes and an *xy* pair, the *y* being much smaller than the *x*. Thus, the mother can contribute nothing but *x* chromosomes to any conception. However, after reduction division has taken place, the father has two kinds of sperm cells, one carrying 24 *x* chromosomes and the other carrying 23 *x* and one *y* chromosome. It is evident, therefore, that if the sperm containing *x* chromosomes enters into conception, an individual with only *x* chromosomes, a female, will result. If, however, the sperm bearing the *y* chromosome fertilizes an egg cell, the *xy* combination, a male, will be produced. The sex of a child, therefore, is actually determined by the father rather than by the mother.

¹⁶ M. S. Gilbert, *Biography of the Unborn*, pp. 77-79.

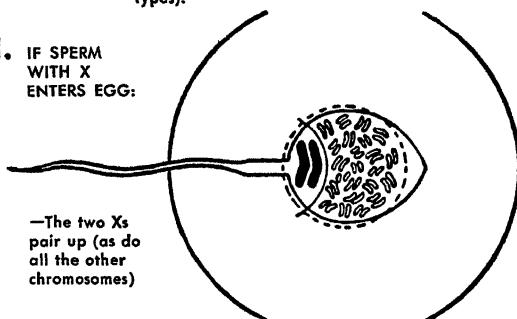
HOW SEX IS DETERMINED

Father produces sperms of two kinds, in equal numbers:

Mother produces eggs all of one kind, - each with a large X sex chromosome.



1. IF SPERM WITH X ENTERS EGG:

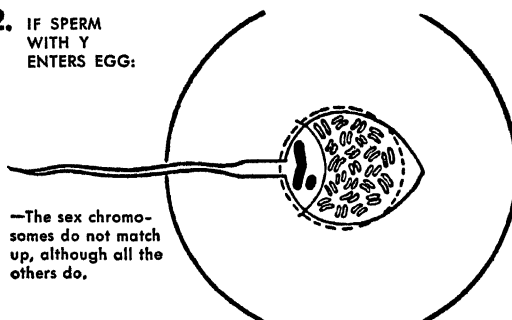


XX:



-A GIRL

2. IF SPERM WITH Y ENTERS EGG:



XY:



-A BOY

FIG. 7. Sex Determination. (Reprinted from *Women and Men* by A. Scheinfeld. By permission of Harcourt, Brace and Company, publishers. Copyright 1943, 1944 by Amram Scheinfeld.)

WHAT CAUSES TWINS AND MULTIPLE BIRTHS?

Most of us are acquainted with twins or have seen them, but probably few people realize that one out of 44 babies born in the United States is a twin.¹⁷ Other multiple births such as triplets, quadruplets, quintuplets, and sextuplets occur with greatly diminishing frequency.¹⁸ Only 47 actual cases of quintuplets have been recorded in the entire world, while six cases of sextuplets have been reported but not authenticated.¹⁹ Apparently, more than six babies have never been born at one time, and it is doubtful if all members of any of the reported sextuplets were alive at once. Statistics show that multiple human births occur more frequently among Negroes than among whites, and more often among whites than among members of the yellow race.²⁰

Many misconceptions and superstitions about twins have existed and may still be found both in our own society and among uncivilized peoples. Twins are regarded as a good omen in some primitive tribes and are accorded special honors and favors, while in other tribes multiple births are regarded as abnormal. Where it is believed that a man can be the father of only one child at a time, twinning is considered evidence of unfaithfulness on the part of the mother. In some instances, also, giving birth to two or more offspring at once is thought to be bestial, resembling the litters of animals, and either the mother, the children, or both may be destroyed.²¹ Even today some authorities²² think that twins and multiple births are undesirable. They have a higher death rate, are more susceptible to birth injuries, show a greater incidence of mental deficiency, and, if they survive, are less likely to become famous.

From the standpoint of heredity it is important to note that there are two kinds of twins, identical and fraternal (see Fig. 8). Identical, or one-egg twins, result from the splitting of a fertilized ovum into two separate cells, each apparently having the power to develop into

¹⁷ H. H. Newman, *Multiple Human Births*, p. 34.

¹⁸ According to Nathan Fasten it is estimated that one set of twins occurs in every 87 confinements; triplets in 7000; quadruplets in 550,000, and quintuplets in 57 million. See "Multiple Human Births," *Hygeia*, 1946, 24:756-757, 796

¹⁹ Newman, *op. cit.*, p. 45.

²⁰ *Ibid.*, pp. 38-39.

²¹ *Ibid.*, pp. 5-8; also read his "Aspects of Twin Research," *Scientific Monthly*, 1941, 52:99-112.

²² Newman, *Multiple Human Births*, chaps. 1 and 4.

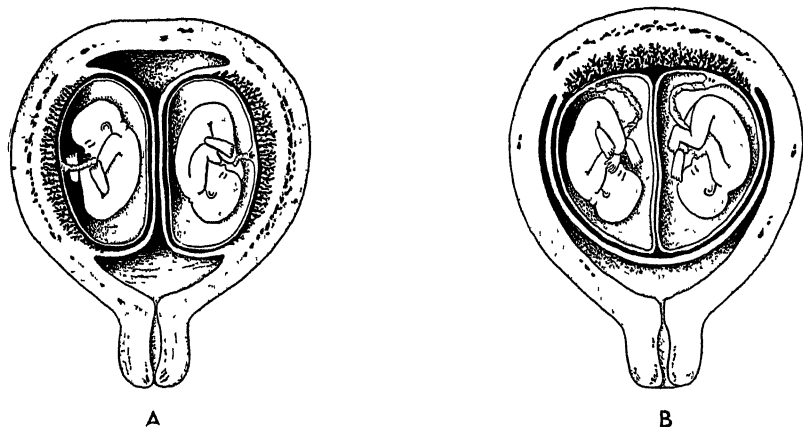


FIG 8 The Two Types of Human Twins (after Bumm) A shows the fraternal or two-egg twins with individual chorions and placentas; B shows the identical or one-egg twins with a single chorion and placenta (Reprinted from *Developmental Anatomy*, Fifth Edition, by L. B. Arey. By permission of W. B. Saunders Company, publishers.)

a complete individual. Since this occurs *after* conception has taken place, one-egg twins are always of the same sex, and it is believed that the gene organization in each twin is identical, accounting for their striking similarity in physical and mental characteristics. The fact that the splitting of the ovum may occur either immediately after fertilization or somewhat later may have a great effect on the characteristics of identical twins. If twinning is moderately late, various degrees of mirror imaging or "reverse patterning" occur, e.g., the right hand of one twin may resemble the left hand of the other more closely than its own left hand. If division comes too late, separation of the individuals may be incomplete, resulting in Siamese twins.²³ It is interesting, too, that after the fertilized ovum splits once, one or both halves may divide and even redivide. Thus, it is possible not only that twins but also that triplets, quadruplets, quintuplets, or sextuplets may be derived from a single egg cell. Something of this nature probably happened in the case of the well-known Dionne quintuplets.²⁴

²³ *Ibid.*, chap. 5. For an interesting account of Siamese twins read J. P. McEvoy, "The Lives and Loves of the Siamese Twins," *Reader's Digest*, September, 1943, 43:67-70.

²⁴ W. E. Blatz et al., *Collected Studies on the Dionne Quintuplets*, "A Biological Study of the Dionne Quintuplets—An Identical Set," by J. W. Mac-

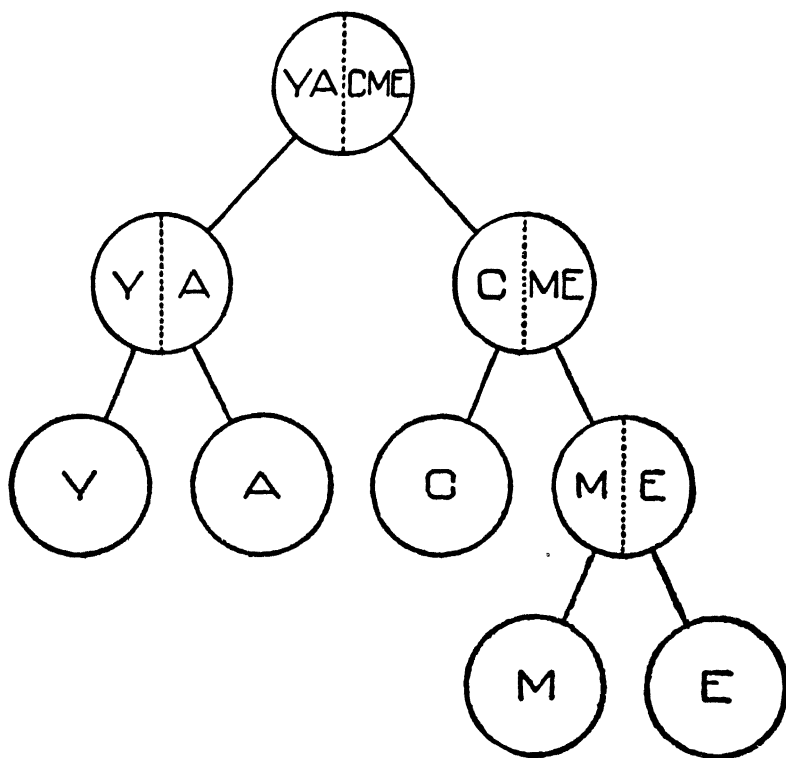


FIG. 9. Diagram Showing the Probable Embryonic Origin of the Dionne Quintuplets (From: *Multiple Human Births* by H. H. Newman. Copyright 1940 by Horatio Hackett Newman, reprinted by permission of Doubleday & Company, Inc.)

Fraternal, or two-egg twins, result from the fertilization of *two* separate egg cells by two sperms. Genetically, therefore, they need be no more alike than brothers and sisters except that they are of the same age or are born within a short time of each other. Strange as it may seem, although fraternal twins must have the same mother, they may have different fathers. This is illustrated by the case of two white girls who had sexual relations in rapid succession with a Negro and with a white man. They each gave birth to twins, one of whom

was white and the other mulatto.²⁵ Obviously, fraternal twins may be of the same or opposite sexes, and may be either similar or quite different in physical and mental characteristics. Triplets, quadruplets, and other multiple births not only may come from a single egg cell, as we have seen, but may result as well from a combination of egg splitting and double fertilization. For instance, let us suppose that there are two fertilized egg cells which ordinarily would develop into fraternal twins. If one of these two egg cells splits, three individuals will be produced.

The question often arises as to whether or not twinning is an hereditary characteristic. There is reason to believe that specific genes produce the biochemical reactions causing a fertilized ovum to split, and that other genes give rise to the conditions making double fertilization possible. In so far, then, as these genes are transmitted according to an hereditary pattern, the tendency to give birth to twins will be inherited, and observation shows that twins do appear consistently in certain families.

WHAT DO WE INHERIT?²⁶

While we must reiterate that genetically it is impossible to separate heredity from environment, we can nevertheless distinguish certain characteristics of the individual which are largely the product of hereditary factors. Thus, the person's tendency to be tall or short; to have a particular type of body build; to have features of a certain shape, as nose, mouth, chin, etc., to have long or short fingers and toes, to have light or dark hair and eyes, and either straight or curly hair; to be of a particular blood type; and to have similar physical characteristics seems to be determined in the main by heredity. Obviously, some of these traits are influenced more readily by environmental conditions than are others. One's height, for example, may tend to follow the stock from which one comes, but it is also affected greatly by nutritional factors. It must be borne in mind, too, that we do not inherit these characteristics *directly*. What we do inherit are *genes*, which, given the requisite conditions, will cause such physical characteristics to develop.

²⁵ Cited by A. S. Wiener in "Heredity and the Lawyer," *Scientific Monthly*, 1941, 52:139-146. This material appeared originally in an article entitled "Jacob and Esau," *Time*, January 8, 1934, pp. 30-32.

²⁶ Scheinfeld, *op. cit.*; Jennings, *op. cit.*

Some geneticists believe that the traits mentioned above follow, in general, the laws of inheritance formulated by Mendel in the latter part of the nineteenth century after extensive experiments with different kinds and colors of sweet peas. He found, for example, that if plants bearing pure red flowers were crossed with those bearing pure white flowers, pink blossoms would result; and if these were self-fertilized, definite proportions of red, white, and pink blossoms would appear. For many years Mendel's work was accepted as the basis for theories of inheritance. More recently, however, it has been pointed out that there is considerable danger in reasoning from plants and animals to man. We have seen that the number of chromosomes is greater in man than in other lower organisms, and this means that the number and complexity of potential gene combinations is infinitely higher. Furthermore, it is difficult to determine experimentally whether or not Mendel's laws apply to human beings in the same way that they apply to plants and animals, because the human reproductive cycle is so long and the number of offspring so limited. Moreover, the laws and customs of society make it impossible to control human matings.

Despite these limitations we do know that the inheritance of some of our traits is in general accord with Mendel's findings. Some genes evidently are more powerful than others, and the traits which they produce, therefore, are more likely to appear. Other genes are weaker, and their effect often is suppressed. The powerful genes are called "dominant," while the weaker ones are known as "recessive."

In the inheritance of any individual, the dominant genes contributed by one parent will cover up the effects of recessive genes contributed by the other parent. Moreover, the expression of dominant and recessive combinations tends to follow a certain definite ratio. An illustration of this is seen in the inheritance of eye color.

In the following diagrams the dominant genes producing brown eyes are represented by capital letters and the recessive genes producing blue eyes are represented by small letters.

DIAGRAM 1

| | B | B |
|---|----|----|
| b | Bb | Bb |
| b | Bb | Bb |

Illustration 1 shows that if one parent has *pure* brown eyes (dominant) and the other parent has *pure* blue eyes (recessive), all their offspring will have brown eyes, but they will not be pure brown (mixed dominance).

DIAGRAM 2

| | B | b |
|---|----|----|
| B | BB | Bb |
| B | BB | Bb |

Illustration 2 shows that if one parent has brown over blue eyes (mixed dominance) and the other has pure brown, half of the offspring will show mixed dominance and half pure dominance.

DIAGRAM 3

| | B | b |
|---|----|----|
| b | Bb | bb |
| b | Bb | bb |

Illustration 3 shows that if one parent has brown over blue eyes and the other has pure blue eyes, half the offspring will have brown over blue eyes and the other half will have pure blue eyes.

DIAGRAM 4

| | B | b |
|---|----|----|
| B | BB | Bb |
| b | Bb | bb |

Illustration 4 shows that if two mixed dominants mate, half of the offspring will be mixed dominants, one quarter will be pure brown and one quarter will have pure blue eyes. Naturally, if pure brown eyes are present in both parents the children will all have pure brown eyes. If the parents have pure blue eyes, then nothing but pure blue eyes will appear in their offspring. Actually, the matter is much more complex than is indicated by the foregoing theoretical diagrams. It is impossible to judge an individual's genetic constitution by his external appearance. A brown-eyed person may be either a pure or a mixed dominant, and the existence of other eye colors such as green or gray show the large number of possible variations in this one characteristic. In addition, gene organizations which are

responsible for certain traits are not always transmitted as a unit, but may break up and form new combinations, thus modifying the trait.

The safest conclusion seems to be that, while inheritance of certain physical traits may follow some definite law, it is practically impossible to tell *a priori* just *which* of these traits a person will possess. All that can be said with certainty is that he will have some of the physical traits of his parents, grandparents, great-grandparents, etc., and that the contribution of each generation diminishes progressively as one goes back into the individual's ancestry.

The existence of the sex-determining *y* chromosomes described previously also introduces further complexity into the process of inheritance. Color blindness is a familiar example of a sex-linked trait. The partially color-blind individual is unable to distinguish red and green, but sees them as gray, whereas the individual who is completely color-blind is unable to distinguish not only red and green but also blue and yellow. The genes responsible for this condition are carried in an *x* chromosome. If this is matched with another *x* chromosome containing the dominant genes for normal eye development, the result will be a female with normal color vision. If, however, the *x* chromosome carrying the genes for color blindness is contributed by the mother, and happens to be matched with the small *y* chromosome of the father, a color-blind male will be born. The explanation seems to be that the chromosome does not contain sufficiently powerful genes to overcome those causing color blindness. Color-blind females occasionally appear as the result of the matching of two *x* chromosomes *both* containing determiners for color blindness. In general, however, the defect is transmitted through the female to the male, and it appears about ten times more frequently among men than among women. Hemophilia, or inability of the blood to clot, is inherited in a similar manner. Examples of this defect may be seen in the former royal families of Europe where it brought about tragic social and political consequences.²⁷

From the standpoint of heredity it is an advantage to the human race to have biparental reproduction. The bringing together of two diverse strains means that the chances are substantially reduced that genes causing defects will meet similar genes. It is much more likely that genes associated with normal development will be matched

²⁷ P. Popenoe, *The Child's Heredity* (The Williams and Wilkins Company, Baltimore, 1929), pp. 85-87.

with the defective ones, canceling their effect. Consanguineous marriages, such as those between cousins or other close relatives, are genetically undesirable, therefore, because they bring together similar strains wherein the same types of defects are likely to exist.

It is important to note that the traits which are most greatly influenced by heredity are of a physical or biological nature. Here seems to be the most significant fact regarding the contribution of inheritance to individual development, viz., that biological structure and potentials for growth are determined by the genes which the individual receives through the mechanism of heredity. Whatever traits are inherited, then, must be those which rest clearly upon structural factors. If, as we have shown elsewhere, inferior intelligence seems to some extent hereditary, it is because intelligence rests upon the biological structure of the brain and nervous system, and this structure is influenced by the type of genes the individual receives. Thus, genes which have been inadequate to develop in parents the type of nervous system required for intelligent behavior will, if transmitted to their offspring, prove inadequate in the same way. It should be emphasized, also, that habits, skills, or knowledge acquired during a person's lifetime do not affect the reproductive cells and, therefore, cannot be passed on to the next generation through the mechanism of heredity. The children of an alcoholic, therefore, will not necessarily become drunkards, although they may inherit a tendency toward nervous instability, which probably was a major cause of their parent's alcoholism.

CAN DISEASE BE INHERITED?

It has been pointed out in the preceding section that defects, such as color blindness and hemophilia, are hereditary, but the belief that certain diseases are inherited is so common that the subject should be mentioned briefly here. Much confusion on this point arises from the failure to distinguish between hereditary and congenital conditions. As we have shown, to be inherited a trait must be associated with the genes which are a part of the reproductive cells. Thus, an inherited disease would mean that the bacteria of the disease were contained in the sperm or ovum. So far as is known, the reproductive cells cannot carry disease; hence, hereditary disease in the strict sense of the term is impossible.

It is well known, however, that certain types of physique are much

more resistant to disease than others. We are all familiar with the person who practically never "catches" colds, as contrasted with the person who is constantly suffering from them. This difference in resistance is also observable in more serious diseases, such as tuberculosis. In so far as resistance to disease depends upon physique, therefore, it is probably influenced greatly by heredity. Thus, if tuberculosis seems to "run in families," it is not because it is directly passed on from parent to child via the reproductive cells but because low resistance is transmitted, and the chance of infection is high.

During the period of growth within the mother's uterus, the child is in the closest possible contact with her. Its life is sustained by oxygen and other necessary elements derived from her blood stream, and, if her blood contains disease germs, these also may be transmitted to the fetus. An infection of this sort is called congenital and occurs after the hereditary processes have taken place. The unborn child may contract certain diseases from its mother, but inheritance has nothing to do with it. One of the most common congenital diseases is syphilis, and because of the general attitude of society toward venereal diseases, much misunderstanding exists concerning it. Many people believe that nothing can be done to prevent the congenital transmission of this disease from mother to child, but it has been shown that antiluetic treatment given to the mother as late as the third month of pregnancy may completely prevent such transmission.

Contrary to widespread popular belief, emotional experience or shock in the mother does not "mark" or in any way affect the unborn child. Prolonged emotional upset, by lowering the mother's vitality, might possibly decrease the amount of nutrition available for the fetus and thus hamper its development to some extent. But careful observation has shown conclusively that fear, horror, despondency, and the like in the mother cannot affect the offspring. Hence, there is no scientific basis for an expectant mother to fear that she may injure her baby through "maternal impressions." Conversely, it is impossible for a mother to develop special talents in her child by concentrating upon these before its birth. The prospective mother who reads poetry zealously, attends concerts, or takes lessons in art, in the hope of establishing these abilities in her baby, is doomed to disappointment.

The extent to which maternal impressions are taken seriously to-

day is shown in the story of the pregnant woman living in a boarding house, who accidentally entered an unlocked bathroom where a man was taking a bath. The experience frightened her so badly that three months later her baby was born with no clothes on! Other physical conditions in the mother prior to the birth of the child may affect his prenatal development, but these obviously are to be classified as environmental rather than as hereditary factors. It has been claimed, for example, that a pregnant woman who smokes may injure her unborn child through the toxic effects of tobacco in her blood stream.²⁸ However, it has been suggested that, if the mother is an habitual smoker, requiring her to give up smoking during pregnancy may cause nervous tension which might be more serious than the tobacco.²⁹ The statement has been made, also, that the use of alcohol by the expectant mother may have an injurious effect upon the developing child. It may be concluded, therefore, that while no direct maternal impressions are transmitted from mother to child, any factors which interfere with maternal health may have an adverse effect upon the development of the fetus. Every new individual, having received the determiners for his general structural development at the moment of conception, begins to develop these potentialities in the sheltered environment of his mother's uterus. The story of this phase of life will be told briefly in the next chapter.

SUMMARY

The present tendency is to regard heredity and environment as integrally related in individual development, functioning from conception throughout the entire life span.

Experiments have shown how both lower organisms and humans may be affected by variations in early environment.

Humans reproduce through the union of two parent cells, the sperm and the ovum.

Heredity is a highly complex process, depending upon the number and organization of the genes contributed to each individual by the two parent reproductive cells.

Sex is determined at the moment of conception, maleness or fe-

²⁸ A. R. Dafoe, *Guide Book for Mothers* (Julian Messner, Inc., New York, 1936), chap 1.

²⁹ F. Teagarden, *Child Psychology for Professional Workers* (Prentice-Hall, Inc., New York, rev. ed., 1946), p. 102.

maleness depending upon the presence or absence of the *y* chromosome.

Identical twins result from the splitting of a fertilized ovum, while fraternal twins result from the fertilization of two separate ova by two sperms. Multiple births may occur either through the redividing of a single ovum or through combinations of identical or fraternal twins.

Physical characteristics, such as height, features, coloring, etc., are generally thought to be influenced most by heredity. Although all human traits may not follow Mendel's laws, we know that some genes are dominant and some are recessive, and that the inheritance of some of our traits does tend to follow a definite ratio.

Some characteristics are sex-linked, such as color blindness and hemophilia.

Biparental reproduction is advantageous because it reduces the possibility that defective genes will come together.

To be hereditary, traits must have a biological basis, and acquired habits, skills, or knowledge cannot be inherited.

There appears to be no inherited disease, but certain conditions in the mother's blood stream may be transmitted congenitally to the unborn child.

Temporary emotional states and "impressions" have no adverse effect upon the offspring, nor is it possible for a prospective mother to develop special talents in her child by concentrating in a particular field.

SUGGESTED ACTIVITIES

1. Find some newspaper or magazine articles reflecting the old point of view of inheritance versus environment.
2. Look up some stories of children reared by animals and be able to discuss them critically.
3. If you are acquainted with twins, find out if they are identicals or fraternal, and explain the criteria you used in making your decision.
4. Read and discuss some recent material on the Dionne quintuplets. How similar are they physically, mentally, and socially?
5. From the standpoint of Mendelian principles, account for your eye color and that of the members of your immediate family.
6. Read and report upon the existing hemophilia in the former royal families of Europe.
7. Discuss any instances with which you may be familiar in which maternal impressions are said to have affected children.

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CHAPTER 3

HOW WE GROW BEFORE AND AFTER BIRTH

WHY SHOULD WE STUDY PRENATAL DEVELOPMENT?

In order to gain insight into the fundamental laws of growth and to grasp its continuity, it is necessary to study the child from conception rather than from birth, as was done formerly. Tremendous development takes place before birth, and behavior after birth depends upon the structures developed by the organism while in the mother's uterus. If one is to understand later behavior, then, he must know its antecedents, and he must realize, too, that birth is but an incident in the growth process.

Much research has been done on the fetuses of lower life forms, such as fish, frogs, toads, salamanders, snakes, and chicks, and on monkeys, kangaroos, opossums, rats, guinea pigs, cats, and rabbits.¹ It was hoped that a thorough study of these fetuses would yield information which would be helpful in understanding the principles of growth governing human development and behavior. As a matter of fact, such knowledge as we possess about the first week of human embryonic life is deduced entirely from the study of animals. No embryologist has as yet actually observed the progress of the fertilized human ovum down the Fallopian tube and into the uterus.² The human fetus, however, has not been overlooked, and investigations have been carried out both on those within the uterus and on

¹ L. Carmichael (ed.), *Manual of Child Psychology*, chap. 2 by Carmichael.

² G. W. Corner, *Ourselves Unborn*, p. 3.

those which have been taken from it. Fetuses within the uterus have been studied by various types of apparatus attached to the mother's abdomen and connected with mechanical recording devices.³ Live fetuses which have been surgically removed in order to protect the mother's health have also been observed carefully. However, there are serious limitations involved in research of this type. For example, the fetus can live only a short time and its reactions may be greatly affected by the artificial environment in which it is kept, viz., a warm salt solution or other fluid medium. Notwithstanding these and other difficulties associated with the study of prenatal growth, many significant contributions have been made, and a vast literature now exists concerning the development of the unborn individual.

HOW LONG IS THE PRENATAL PERIOD?

In general it is difficult to say just when conception occurs, and various criteria are used to determine the "zero point" of development.⁴ These take into consideration such factors as time of the last menstrual period before pregnancy, date of last copulation, if that is known, etc.

In any organism it is customary for embryologists to classify development into three stages: (1) the germinal, (2) the embryonic, and (3) the fetal. The duration of each period depends obviously on the particular organism concerned, but despite great variability the germinal stage in humans extends from conception to the end of the first or second week. In this stage the potential individual has an "egg-like organization" and bears little resemblance to a human being. The embryonic stage of development follows, and terminates roughly at about the eighth week after conception. During this period there is a rapid change from the ovular form to one which is more human looking. The last or fetal stage, which ends at birth, marks the beginning of true function and is characterized by vast changes in growth.

Length is the criterion used in estimating the age of fetuses which have been removed from the mother before birth, and tables have been provided to assist in such calculations.⁵ It has been suggested

³ J. Bernard, "Human Fetal Reactivity to Tonal Stimulation," *American Psychologist*, 1946, 1:256.

⁴ Carmichael (ed.), *op. cit.*, pp. 97-98.

⁵ *Ibid.*, p. 99, also L. B. Arey, *Developmental Anatomy*, pp. 113-115.

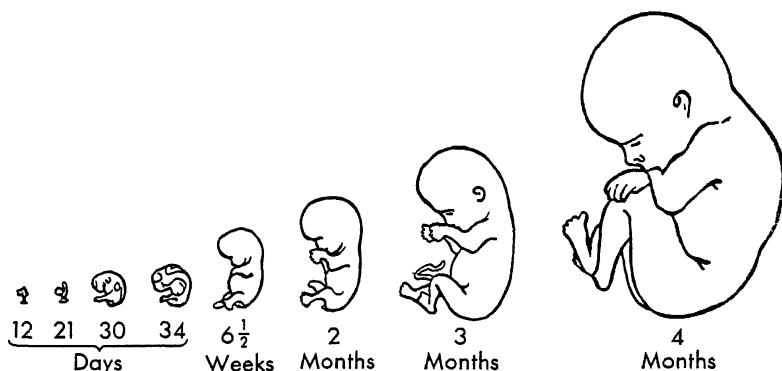


FIG. 10. Eight Stages in the Development of the Human Fetus 12 Days, 21 Days, 30 Days; 34 Days, 6½ Weeks, 2 Months, 3 Months, 4 Months. (Reprinted from *Mother and Baby Care in Pictures*, Second Edition, Revised, by L. Zabriskie. By permission of the J. B. Lippincott Company, publishers.)

that the best index of fetal length is the distance from crown to rump. Curiously enough, although weight is considered to be a better measure of fetal development than height, it is scarcely ever employed.⁶

The duration of the total prenatal period varies anywhere from 215 to 334 days, but some authorities place the length of normal pregnancy at around 280 days.⁷ Fetuses born after 180 days of gestation or even earlier are known to have lived, and legally 334 days marks the limit of postmaturity, although other factors must be considered.⁸

STAGES IN PRENATAL DEVELOPMENT

THE GERMINAL PERIOD

As we have seen in Chapter 2, page 33, life begins from a tiny egg cell or ovum of from $\frac{1}{175}$ to $\frac{1}{200}$ of an inch in diameter.⁹ From this simple beginning as a single reproductive cell the new individual grows until at the time of birth he has 200 billion cells of various types.¹⁰ After fertilization by a male sperm in the Fallopian tube, the

⁶ *Ibid*

⁷ A. Gesell, *The Embryology of Behavior*, p. 13.

⁸ Carmichael (ed.), *op. cit.*, p. 100.

⁹ Gesell, *op. cit.*, p. 19.

¹⁰ Corner, *op. cit.*, p. 1.

egg cell begins to expand by division and redivision, forming a small solid ball of cells and continuing its journey down the tube toward the mother's uterus. If, as occasionally happens, it becomes lodged within, or attached to, the inner surface of the Fallopian tube, a tubal pregnancy results, which must be surgically removed. Normally, however, the progress of the developing ovum down the four-inch tube is unimpeded, requiring about three days, and after remaining a week in the cavity of the uterus it attaches itself to the inner uterine wall by burrowing into the tissues. This marks the end of the germinal period, lasting in all about ten days, although in some instances it may extend to two weeks or longer. Considerable growth has taken place, as is evidenced by the fact that the ovum may now be as much as one-fifth of an inch in diameter.¹¹ During the remainder of its prenatal life the developing child lives as a parasite, receiving its nourishment from the mother until birth.

THE EMBRYONIC PERIOD

At the beginning of the embryonic period special structures are formed to provide adequate nourishment and protection for the developing embryo. A circular membrane, called the placenta, develops in the tissues lining the mother's uterus, and is joined to the embryo by means of the umbilical cord. The placenta grows until at around six months it covers approximately half of the inner wall of the uterus. It absorbs oxygen, water, and nutritive products from the mother's blood and passes them to the embryo through the cord. Waste products from the embryo, also, are brought to the placenta where they are transferred to the mother's blood stream and excreted by her. It must be emphasized that, contrary to widespread belief, the mother's blood does not circulate through the developing child. Their circulatory systems are entirely separate, meeting in the placenta, which acts as a filter between them. There is no other connection between the mother and her unborn child.

Another structure which develops early is the amniotic sac, a sort of water jacket surrounding the embryo and filled with amniotic fluid. This protects the embryo from severe blows or jolts which the mother may experience during pregnancy.

These structures are useful only during prenatal life and are discarded at birth. The amniotic sac ruptures, allowing the fluid to es

¹¹ Gesell, *op. cit.*, p. 23.

cape from the uterus shortly before the baby is born, while the sac itself, the placenta, and the cord are cast off as the afterbirth.¹²

As early as the second week of prenatal life a middle layer known as the mesoderm develops in the disk-shaped embryo between the outside or top layer, the ectoderm, and the bottom layer or entoderm. From the ectoderm are formed the outer skin, brain, spinal cord, and nerves. The mesoderm gives rise to the skeleton, muscles, heart, blood vessels, and connective tissues. The stomach, intestines, liver, pancreas, etc., and the respiratory organs are developed from the entoderm.¹³

About the eighteenth day the heart structure begins to appear and by the end of the third week it starts to function.¹⁴ This early heart-beat, however, probably is the result of independent muscle contraction and is not caused by neural stimulation, as is the case in the adult. It is not generally regarded, therefore, as the beginning of true behavior.¹⁵

Approximately at this time, too, the fundamental pattern of the nervous system is laid down. A fold appears in the outer embryonic layer which later becomes the neural tube. Eventually, the brain develops from the upper end and the spinal cord from the lower part of this tube "By the end of the first month the human embryo is a small, soft creature, about one-fourth of an inch long, whose head is deeply bowed, who has a short pointed tail curled up below his belly, and small nubbins on the side of his body—incipient arms and legs."¹⁶ At the same time the human embryo shows that almost all the bodily organs as well as the sense organs have begun to appear: the lungs, liver, primitive kidney, endocrine glands, and rudimentary eyes, nose, and ears.

Functioning of some of the internal organs begins during the second month, as, for example, the liver; sex recognition, viz., the differentiation of the external sex organs, is possible; the face and the neck develop, the limb buds or stubs which project from the sides of the body elongate, and finally fingers and toes are formed at their flattened extremities; the trunk is lengthening; muscles and bones

¹² M. S. Gilbert, *Biography of the Unborn*, chap. 2, also Corner, *op. cit.*, pp. 18-53.

¹³ Gilbert, *op. cit.*, pp. 22-23.

¹⁴ Gesell, *op. cit.*, pp. 26-27.

¹⁵ Carmichael (ed.), *op. cit.*, p. 108.

¹⁶ Gilbert, *op. cit.*, pp. 27-28



FIG. 11 The Skeleton of a Two-Month Human Embryo. (Reprinted from *Biography of the Unborn*, 1938, by M. S. Gilbert. By permission of the Williams and Wilkins Company, publishers, Baltimore.)

develop, and the embryo begins to look like a human being. (See Fig. 11.)

In its development the embryo follows two fundamental laws. The first is concerned with the direction of growth from the head region to the feet, while the second applies to the extension of structure from the trunk out to the periphery of the body. The development of

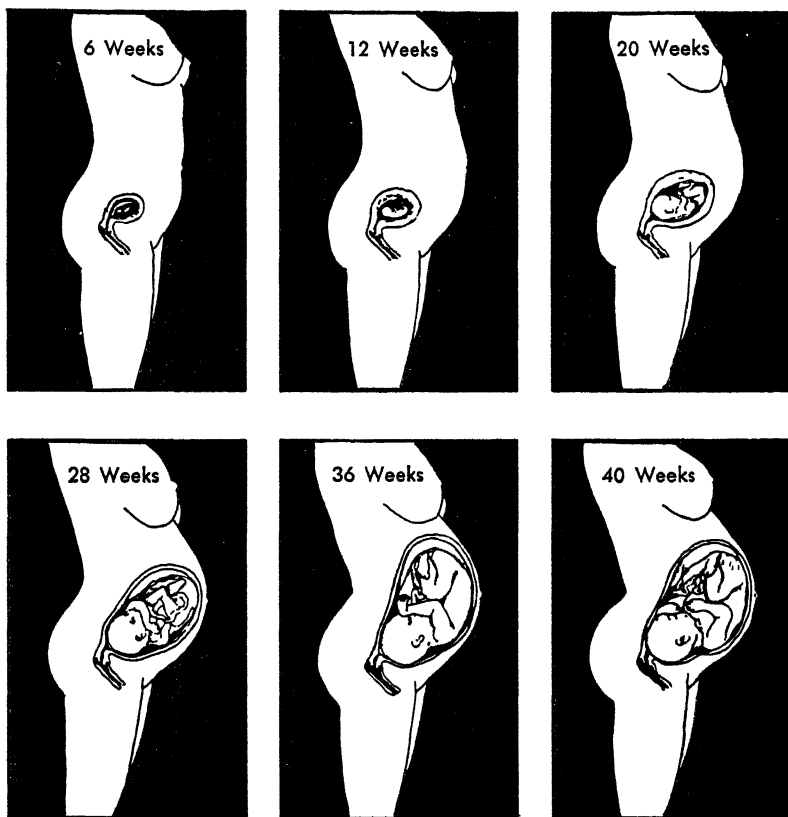


FIG. 12. Six Positions of the Fetus in the Mother's Uterus at 6, 12, 20, 28, 36, and 40 Weeks (Reproduced from the film, *The Birth of a Baby*. By permission of Dr. Fred L. Adair, General Chairman, The American Committee on Maternal Welfare, Inc., 24 W. Ohio Street, Chicago 10, Illinois.)

the embryo proceeds from the head downward, the arms developing before the legs and the fingers appearing prior to the toes. These laws, as we shall see, also operate after birth.

Despite nature's careful provisions for the nourishment and protection of the individual during prenatal life, many hazards exist. It is estimated that of all ova fertilized possibly one-third do not survive until birth.¹⁷ Developmental irregularities may arise at any time during the prenatal period, but probably most of the serious abnor-

¹⁷ Corner, *op cit*, p. 73.

malities occur in the first two months of embryonic life.¹⁸ Incomplete development of the upper lip and of the roof of the mouth, resulting in harelip and cleft palate, are among the most common types of abnormalities. Fortunately, these conditions often can be corrected or greatly improved by surgery. Among other abnormalities which happen less frequently are the persistence of the evolutionary tail and the abnormal joining of two individuals, as in Siamese twins.

Much speculation has existed for centuries concerning the causes of these defects. They were once believed to be the result of maternal impressions, as is illustrated by the statement of a seventeenth-century writer that "If a great-bellied woman see a hare, her child will often have a hare-lip."¹⁹ It will be recalled that such explanations are no longer tenable, even though belief in them still persists.

Some embryologists have maintained that faulty nutrition, associated in certain instances with diseased conditions of the uterus, were almost entirely responsible for such irregularities in development. Although conditions of this kind undoubtedly may produce abnormalities, it is now known that they can arise, also, as the result of certain genes²⁰ and are, therefore, hereditary. Luckily, most of these lethal genes are recessive, hence the chances that their effects will appear are greatly lessened. In short, as one writer suggests,²¹ structural abnormalities in prenatal life may be the result either of a good egg in a bad environment or a bad egg in a good environment.

THE FETAL PERIOD

The fetal period is the third stage of prenatal life, and it is during this time that certain basic structures and functions mature sufficiently to prepare the individual for existence independent from the mother. The psychologist is especially interested in this period because it marks the beginning of *true* behavior.

It has already been noted that the heart functions during the early part of the embryonic stage but that this is not to be regarded as genuine behavior. The rhythm of the heartbeat changes with age, and during the fetal period it is twice as fast as the mother's.²² Cir-

¹⁸ Gilbert, *op. cit.*, p. 105

¹⁹ Corner, *op. cit.*, p. 53 Quoted from the *Anatomy of Melancholy* by Robert Burton, first published in 1621.

²⁰ Corner, *op. cit.*, pp. 97-107.

²¹ *Ibid.*, p. 83.

²² Gesell, *op. cit.*, p. 37

culatory changes also occur, and chest movements supplement the action of the fetal heart.²³

Around the beginning of this period movement may occur in the digestive organs as a result of *internal* stimulation.²⁴ The semicircular canals, a part of the structure of the inner ear, are said to begin their function as early as the middle of the seventh week and attain their adult size by the end of the prenatal period.²⁵ These organs are essential for upright posture and balance, and are a part of the necessary equipment for walking.

With the progressive maturation of nerves and muscles, generalized movements in response to *external* stimulation appear early in the third month.²⁶ At first, reactions can be secured only when stimulation is applied to the area around the mouth and nose. Such movements include flexion of the head and shoulders, bending of the trunk, and rotation of the rump. These early movements of the head and shoulders are the forerunners of the tonic neck reflex, abbreviated as the t-n-r, which is basic to the later development of posture and manipulation.²⁷ Later in the same month spontaneous movements of approximately the same nature occur independently of mechanical stimulation, although they are too weak as yet to be perceived by the mother.

During the third month, too, the kidneys function. The discharge seeps into the amniotic fluid which surrounds the fetus, but most of its waste products still are excreted by the mother. Many changes take place in the structure of the mouth, nose, and throat; sockets for the teeth appear; and sexual development takes place.

The greatest growth occurs during the third and fourth months.²⁸ In this period the fetus grows six to eight inches in length, about half its height at birth. The toe and finger patterns which persist throughout life are also laid down in the fourth month.²⁹

²³ Carmichael (ed.), *op. cit.*, p. 104.

²⁴ *Ibid.*, p. 106.

²⁵ Gesell, *op. cit.*, pp. 30, 32.

²⁶ W. Preyer, *Embryonic Motility and Sensitivity* (translated by G. E. Coghill and W. K. Legner), Monograph II, No. 6, Serial No. 13 (Society for Research in Child Development, National Research Council, Washington, D.C., 1937), pp. 31-38, 77; W. S. Ray, "A Preliminary Report on a Study of Fetal Conditioning," *Child Development*, 1932, 3:175, 177.

²⁷ Gesell, *op. cit.*, pp. 56-60, also Gesell, "The Genesis of Behavior Form in Fetus and Infant," *Proceedings of the American Philosophical Society*, Philadelphia, 1941, 84:471, 488.

²⁸ Gilbert, *op. cit.*, p. 63.

²⁹ *Ibid.*, p. 67.

Between the fourth and fifth months the generalized body movements referred to above become differentiated.³⁰ For example, the head can nod independently of the trunk, and the arms and legs alternate in a sort of swimming motion. By this time, too, most of the basic reflexes are established.³¹ The mouth opens and closes, and swallowing and tongue movements occur. Stimulation of the palm of the hand produces finger closure, a necessary antecedent to grasping. This palmar reflex apparently precedes the plantar reflex, which is elicited by applying a stimulus to the sole of the foot. In the fetus this response takes the form of flexion of the toes or withdrawal of the foot.³² It may also appear a little later as the Babinski reflex, involving the extension of the great toe and occasionally the fanning of the other toes. This Babinski response, as will be seen later, persists after birth. The few remaining reflexes, requisite to survival after birth, mature between the fifth and sixth months.

As the fetal stage progresses, the number of spontaneous movements increases greatly from one or two a day at the beginning to as many as 200 or more daily just prior to birth.³³ The vigor of these movements also increases, and although they can be detected during the fourth month with a stethoscope, the mother ordinarily is not aware of them until the fifth month. The hair, nails, and skin are developed during the fifth month and the fetus is protected from the chemicals with which it comes in contact by a cheesy substance formed through the secretions of the sebaceous glands.³⁴ Some of the glands of internal secretion, such as the thyroid, pancreas, and pituitary, also begin to function about this time. The tonic neck reflex is now well established and will persist for many weeks after birth.

In addition to the organic, static, and tactual responses already mentioned, some sensory development is present before birth,³⁵ but the exact extent of its function is difficult to determine. From the information which is available we may assume that there is some fetal

³⁰ Gesell, *The Embryology of Behavior*, p. 56.

³¹ Barker, Kounin, and Wright (eds.), *Child Behavior and Development*, chap. 2 by D. Hooker.

³² F. D. Brooks, *Child Psychology* (Houghton Mifflin Company, Boston, 1937), pp. 88-89.

³³ Gesell, *The Embryology of Behavior*, p. 70.

³⁴ Gilbert, *op. cit.*, p. 72.

³⁵ Carmichael (ed.), *op. cit.*, pp. 121-138.

response to heat and cold and that pain is poorly developed. The eyelids, which have been closed from the third month, reopen during the sixth month, and the eyes are able to respond to light by the seventh month. Experiments indicate that hearing may be possible despite the fact that the Eustachian tube, connecting the ear and throat, is filled with fluid. Since that part of the brain which governs smell is one of the earliest areas to develop, this ability is probably ready to function at birth. Taste buds, also, are capable of functioning if stimulation is provided.

It is interesting to note that crying and hiccuping may occur between the fifth and sixth months.³⁶ Probably it is quite common, but it is difficult to detect because the sound is muted by the fluid surrounding the fetus. A recent item in the daily press³⁷ reported the case of an infant's crying audibly a full hour before birth. This incident was confirmed by physicians and others at the Good Samaritan Hospital in Cincinnati, Ohio, where the delivery took place. Whether or not the fetus sleeps is not definitely known, although the quiescent periods observable during this stage may indicate sleep.

There is still comparatively little data concerning the prenatal growth of the brain and nervous system. It will be recalled that the basic pattern of the nervous system was laid down during the early part of the embryonic period. In the fourth week the primitive brain and spinal cord become differentiated in the neural tube. In subsequent months the nerves increase in complexity and become connected with the sense organs and brain. By the third month special regions develop in the lower part of the brain, viz., the cerebellum and the medulla, and the upper brain or cerebrum divides into two parts or hemispheres.³⁸ (See Fig. 13.) These different areas of the brain do not grow evenly. The regions concerned with motor development mature far in advance of the others,³⁹ and although the total number of cells in the upper brain or cortex is present at birth, they are not sufficiently developed to function. This means that fetal behavior is governed primarily by the spinal cord and lower brain centers. Evidence for this conclusion is seen further in the fact that if the cerebral cortex of a well-developed fetus is removed, there is no

³⁶ *Ibid.*, p. 107, Gesell, *The Embryology of Behavior*, p. 82

³⁷ The Charleston Daily Mail, August 15, 1947.

³⁸ Gilbert, *op cit.*, p. 84.

³⁹ Carmichael (ed.), *op. cit.*, chap. 7 by M. B. McGraw, especially pp. 353-356.

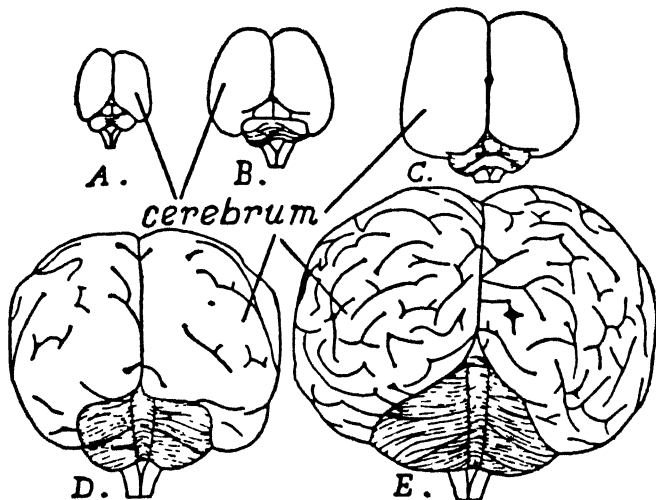


FIG. 13. Five Stages in the Development of the Human Brain. A represents the third month; B the fourth month; C the fifth month, D the seventh month, and E the ninth month (after Retzius and Broman). (Reprinted from *Biography of the Unborn*, 1938, by M. S. Gilbert. By permission of the Williams and Wilkins Company, publishers, Baltimore.)

effect upon its activity. Children born without a cerebrum⁴⁰ also show normal reflexes, and birth injuries to the cortex of the brain may not become evident for some time. Studies of brain waves or electroencephalograms⁴¹ show only occasional, faint, and irregular traces in the fetus, and definite rhythms are not observed until the fourth month after birth. Because of this lack of development in the cerebral cortex, some authorities doubt the possibility of consciousness in the newborn baby.

WHAT IS THE NATURE OF FETAL BEHAVIOR?

We have seen that fetal behavior includes two broad types of reactions: (1) generalized movements involving most or all of the body, and (2) specific reflexes confined to somewhat limited areas. These reflex responses may occur singly or become organized into more complex wholes. An example is shown in the reflex actions of sucking and swallowing which become organized into the feeding

⁴⁰ W. Dennis, "Is the Newborn Infant's Repertoire Learned or Instinctive?" *Psychological Review*, 1943, 50:330-337.

⁴¹ N. Munn, *Psychology* (Houghton Mifflin Company, Boston, 1946), p. 63.

response shortly before birth. The question now arises as to whether generalized reactions or specific reflexes appear first in the development of behavior. This problem has caused much discussion among anatomists, neurologists, and psychologists and is still the subject of controversy.⁴²

Dr. John B. Watson, who popularized behavioristic psychology in the early 1920's, took the point of view that the simple reflex is the basic unit of all human behavior.⁴³ According to his theory complex reactions are organized chains of simple reflexes. Opposed to Watson's view was that of the late Dr. G. E. Coghill, who, beginning in 1902, published a series of papers reporting his work on a type of salamander known as *Amblystoma*.⁴⁴ In its early development this creature is an amphibian with characteristic swimming behavior. Later it becomes a land animal with walking as a means of locomotion. Coghill showed that the first movements observable in *Amblystoma* (also spelled *Ambystoma*) originate in the neck region and proceed downward toward the tail. These early movements represent a sort of widespread "fluttering." Later there is a bending of the organism, forming a tight "C" coil, and this, in turn, produces an "S"-shaped movement by rapid bending alternately to right and left. This "S" motion is the basis for swimming, and, slowed down in the land stage of the animal's development, it is the foundation for walking. (See Fig. 14) Coghill concluded: first, that behavior develops in a head-to-foot direction; second, that early behavior is generalized and diffuse in nature; and third, that there is a definite correlation between the maturation of structure and the nature of function. Specific responses develop from mass behavior as the nervous system matures by the process of individuation.⁴⁵ The extent to which Coghill's findings concerning *Amblystoma* can be applied to the development of the human fetus is a matter over which there is considerable disagreement. It is not known as yet if the findings apply to all living organisms, and we must guard against the assumption that apparent similarities between *Amblystoma* and other organisms prove the existence of a genuine parallel in all mammals, including man. Nevertheless, observations of the human embryo and fetus

⁴² Barker, Kounin, and Wright (eds), *op cit.*, chap. 3 by O. C. Irwin.

⁴³ Carmichael (ed), *op. cit.*, p. 333.

⁴⁴ *Ibid.*, p. 51.

⁴⁵ G. E. Coghill, *Anatomy and the Problem of Behavior*.

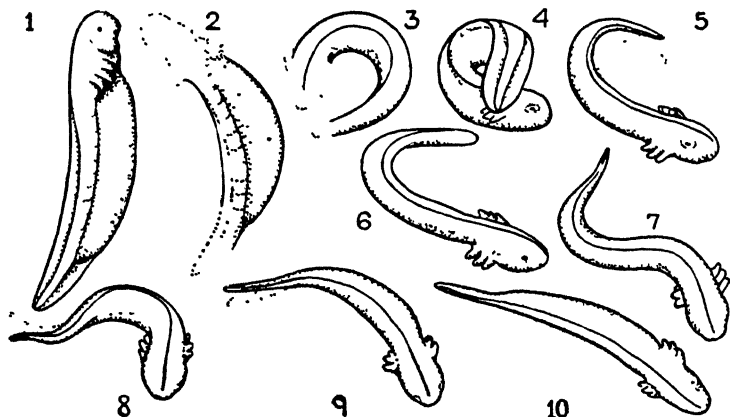


FIG. 14. Stages in the Behavior of *Amblystoma* Showing the Early Swimming Movement. Position 1 shows the animal at rest. In position 2 the head is moving so rapidly to the left that it blurs. Positions 3 and 4 show a coil completed. The trunk is straightened out in positions 5 and 6, but the original flexure still affects the caudal or tail part. In 7 bending to the right has begun, while the original flexure is passing tailward. In 8 the first flexure has almost disappeared, and in 9 the animal is straightening out to its resting position shown in 10 (Reprinted from *Anatomy and the Problem of Behaviour* by G. E. Coghill. By permission of the Cambridge University Press, publishers. Copyright 1929 by the Cambridge University Press.)

show certain interesting trends which support Coghill's hypothesis.

It has been noted already that embryonic growth proceeds in general from head to foot and that the maturation of function also tends to follow this law. The first fetal movements, whether spontaneous or the result of external stimulation, apparently begin in the head region and continue downward. Furthermore, these movements are generalized and diffused, resembling roughly the "fluttering" of the *Amblystoma*. The bending of the head and shoulders and also the trunk and limb movements suggest the type of activity observed by Coghill. It has been noted, too, that specific reflexes appear in the human fetus later than generalized movements, and that this trend toward specificity continues throughout the fetal period and into infancy. It is not yet entirely clear whether these specific reflexes are individuated from mass behavior, as Coghill believed, or whether mass and specific behavior develop simultaneously. It is possible, also, that what appears to be mass behavior may be in reality aggre-

gations of reflexes, or the successive stimulation of one area of the body by the activity of an adjacent area.⁴⁶

It is unnecessary for us to enter this controversy, but, for our purposes, we may conclude that both generalized and specific behavior are present not only in the fetal period but also in the newborn individual. Present evidence seems to favor the generalization that with some exceptions mass reactions usually precede specific responses. This conclusion appears to be in harmony with the hypothesis that mass behavior results from the immaturity of nervous structure and that, as the nervous system matures, more specific behavior becomes possible.

HOW IS A BABY BORN?

The condition of both the mother and the fetus, obviously, will determine when and how the baby is born. Usually, the fetus is expelled from the vagina after a period of about nine months or around 280 days. In some cases, however, the child may be born before that time. If birth occurs too early, chances of its survival are lessened. According to vital statistics a seven-month fetus has one chance in two for survival, a six-month fetus only one chance in five. The common idea, dating back to antiquity, that a child born two-months prematurely has a better prospect for living than the one delivered a month before it is normally due is erroneous.⁴⁷ The fetus must reach a certain degree of maturity before it can survive as an independent organism, and, as we have seen, vital reflexes such as those concerned with sucking, swallowing, and breathing often are sufficiently developed by the seventh month to permit extrauterine existence. In general, however, an infant's chances for survival increase as the span of intrauterine life is prolonged to full term. When a child is born beyond the usual period of gestation, it is referred to as "postmature" and is much better developed than the ordinary nine-month baby. In deciding whether a fetus is premature, at term, or postmature, the exact time of fertilization and other facts about conception must be known in addition to its length, weight, and condition at birth. Although there are great variations among women in

⁴⁶ N. L. Munn, *Psychological Development: An Introduction to Genetic Psychology* (Houghton Mifflin Company, Boston, 1938), pp. 187-194.

⁴⁷ J. W. Nagge, *Psychology of the Child* (The Ronald Press Company, New York, 1942), p. 55.

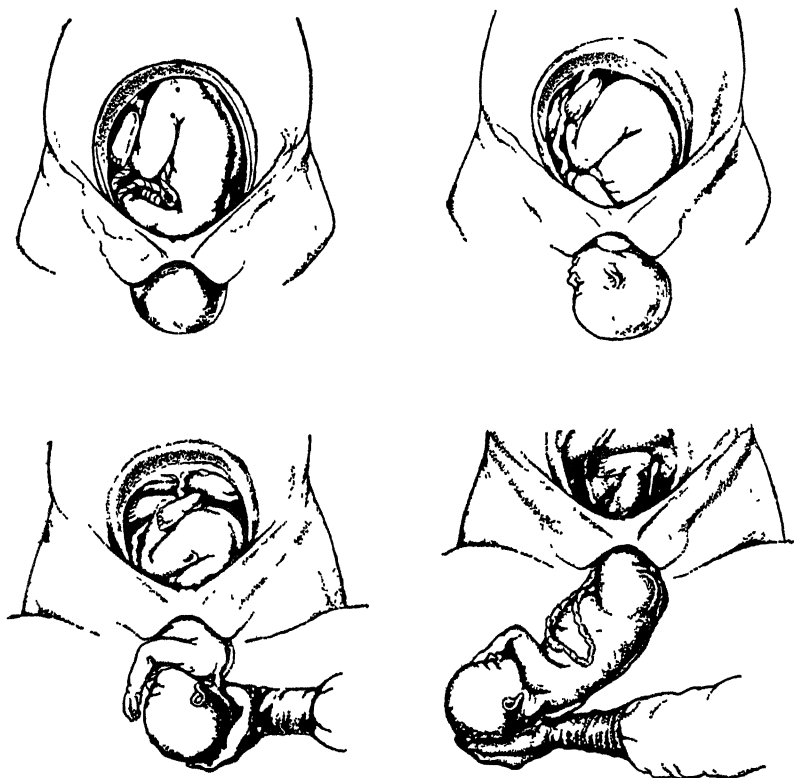


FIG 15. How a Baby Is Born by Means of Vertex Presentation. (Reproduced from the film, *The Birth of a Baby*. By permission of Dr Fred L Adair, General Chairman, The American Committee on Maternal Welfare, Inc., 24 W. Ohio Street, Chicago 10, Illinois.)

the duration of pregnancy, "All the pregnancies of the same woman are likely to be of approximately the same length."⁴⁸

There are several ways in which a child may be born.⁴⁹ The usual method, wherein the baby passes head first through the birth canal into the outer world, is called vertex presentation. (See Fig. 15.) The head emerges first, followed by one arm and then the other; the trunk and legs coming last. Birth is not complete, however, until the child is detached from the umbilical cord. The length of the birth

⁴⁸ Gesell, *The Embryology of Behavior*, p. 13.

⁴⁹ L. Clendening, *The Human Body* (Alfred A. Knopf, New York, 3rd ed., 1941), pp. 339-358; L. Zabriskie, *Mother and Baby Care in Pictures*, chap. 6.

process varies, ranging anywhere from five hours to more than a day, the first birth usually being the slowest.

More difficult types of delivery are transverse presentation, wherein the fetus lies crosswise in the mother's uterus, and breech presentation, in which the baby's buttocks appear first, then the legs, and finally the head. These two methods are potentially dangerous for the infant, since delay in the emergence of its head may result in suffocation. Often, however, a skilled obstetrician can change the position of the fetus within the uterus so that it can be born normally. Occasionally, too, instruments must be used to facilitate the baby's passage through the birth canal.

When measurements indicate that the mother's organs are too small to permit normal delivery, or if her health makes it inadvisable for her to undergo prolonged labor, surgical delivery through the mother's abdominal wall is necessary. This technique is known as Caesarian section and is so named because Julius Caesar is said to have been born in this way. Usually the method involves fewer chances of injury to the fetus, but the difficulties of establishing respiration are increased.⁵⁰

Birth is a most severe ordeal, and it is rather surprising how few babies suffer from injuries or other permanent effects resulting from it. The average newborn individual is exhausted after this experience and may require anywhere from ten days or two weeks to a month to recover. When its connection with the mother is severed, the child must depend upon its own organs for breathing, digestion, and elimination. It must adjust, also, to an environment which is quite different both physically and psychologically from its intra-uterine life. For instance, it must now adapt itself to an ordinary and sometimes variable room temperature of 68 to 70 degrees Fahrenheit, after having been accustomed to a constant temperature of around 100 degrees Fahrenheit. From a fluid environment it is now placed in surroundings where air must be inhaled and exhaled. As is commonly observed, the newborn loses weight after birth because of the evaporation of water from its tissues. However, this weight is regained by the end of the neonatal period.

Although the psychologist must of necessity be interested in the physiological changes brought about by birth, he is much more concerned over the social factors which will confront the child in his

⁵⁰ Gesell, *The Embryology of Behavior*, pp 80-82.

extrauterine life.⁵¹ From limited stimulation within his mother's uterus, he is now exposed to a complex and variable environment where he will be influenced not only by various mechanical stimuli but also by his mother, father, brothers, sisters, and other people with whom he happens to come in contact and to whom he will have to adjust during the remainder of his lifetime.

WHAT IS THE NEWBORN BABY LIKE?

Before the appearance and activities of the baby at birth are discussed, we should explain the meaning of the terms "neonate" and "neonatal." A newborn baby is referred to as a "neonate," and the period required to make the transition from intrauterine life to life in the outer world is called "neonatal." As stated in the preceding section, it takes the newborn ten days to a month to recover from birth shock, and this phase of his development is referred to as the neonatal period. According to various authorities, the period continues until the weight lost after birth is regained, or until the navel is healed.⁵²

The arrival of a newborn infant may be announced by a cry or a sneeze. The birth cry has been interpreted variously by philosophers, poets, and scientists as a "shout of joy," "the nightingale song for mother and father," or as a reflex cry which marks the beginning of independent respiration. This last explanation is now generally accepted, and no emotional significance is to be attached to the birth cry.⁵³

It is difficult to say what the measurements of a child at birth should be, because so many complicating factors are involved. Estimates of the average weight for boys at birth are around 7 pounds and 8 ounces; for girls, about 7 pounds. The average length for boys at birth may be approximately 20.5 inches; for girls, 20.3 inches or less.⁵⁴

The face looks broad and short because of the lack of erupted teeth and the undeveloped jaw. The nose is flat; the eyes are blue-gray, but may gradually change their color; and their motion is un-

⁵¹ Munn, *Psychology*, p. 63.

⁵² E. B. Hurlock, *Child Development* (McGraw-Hill Book Company, Inc., New York, 1942), p. 76, Carmichael (ed.), *op. cit.*, chap. 4 by K. C. Pratt.

⁵³ M. W. Shinn, *The Biography of a Baby* (Houghton Mifflin Company, Boston, 1900), pp. 21, 22.

⁵⁴ Obtained from a chart used in a hospital at Charleston, West Virginia.

controlled, sometimes giving the appearance of cross-eyedness. Tears are not present at birth and do not appear for some weeks.⁵⁵

The neonate looks top-heavy, since his head is very large in proportion to the rest of his body. One author makes these comparisons: The head of a two-month fetus equals one-half its length; the head at birth is one-fourth of the length; and the head in the adult is equal to one-tenth the length.⁵⁶

The neonate's neck is short and the skin lies in folds or creases. The arms and legs, too, are unusually short. The muscles are small, soft, and uncontrolled and do not grow as fast as the rest of the body in infancy. The soft, downy hair on the back, which appears in the fetal stage, is present at birth but comes out during the first few months of life. The skin is soft but firm, and may be a deep pink in color.

Birthmarks, also, may be present in the newborn and, if they continue into adulthood, may have important psychological, social, and economic consequences. Some of these marks may result from the use of instruments at birth and usually disappear in a short time. Skin blotches in the neonate may be caused, too, by temporary circulatory conditions and generally clear up soon. Marks caused by uneven distribution of pigment in the skin, however, are the work of certain unusual genes and are, therefore, hereditary. Such blemishes, which persist throughout life, may be aggravated by patches of skin which are raised as well as discolored. More rarely, serious hereditary skin conditions may occur, sometimes leading to cancer.⁵⁷ It is often said that birthmarks result from emotional conditions of the mother during pregnancy, or from her cravings for certain foods, such as strawberries or cherries. Obviously such explanations are merely old wives' tales and have no scientific foundation.

The newborn baby sleeps a great deal of the time, at first about 80 percent or, roughly, 15 to 20 hours or more a day. Short waking periods occur about every two hours, usually shorter and fewer at night than in the daytime. The total amount of sleep decreases until

⁵⁵ W. Rand, M. E. Sweeny, and E. L. Vincent, *Growth and Development of the Young Child* (W. B. Saunders Company, Philadelphia, 3rd ed., 1941), chap. 1.

⁵⁶ Gilbert, *op cit.*, pp. 63-64

⁵⁷ A. Scheinfeld, *You and Heredity* (J. B. Lippincott Company, Philadelphia, also Garden City Publishing Company, Inc., New York, reprint ed., 1945), pp. 146-147, 197.



FIG 16. The Neonate (Through the courtesy of a Charleston, Wes' Virginia, mother.)

the end of the first year, but the duration of single sleeping periods increases.⁵⁸

A sleeping posture frequently described is that of the infant "lying on its back with knees flexed; fists closed; upper arms out straight from the shoulders, fore-arms flexed at right angles so that they are parallel to the head; fists below chin; mouth closed, etc."⁵⁹ It has also been suggested that the sleeping posture of the neonate is similar to its position when an embryo. (See Fig. 16.)

Another writer says: "The commonest posture of the newborn baby when sleeping on his back was with knees somewhat flexed, arms flexed at the elbow, upper arm close to the sides, palms facing outward, fists closed, and hands lying at the shoulder level."⁶⁰

⁵⁸ S. Blanton and M. G. Blanton, *Child Guidance* (Appleton-Century-Crofts, Inc., New York, 1935), chap. 5.

⁵⁹ Dennis, "A Description and Classification of the Responses of the Newborn Infant," *Psychological Bulletin*, 1934, 31.5-22

⁶⁰ M. M. Shirley, *The First Two Years*, Vol. I, *Postural and Locomotor Development* (The University of Minnesota Press, Minneapolis, 1931), p. 44.

A more recent investigator takes issue with the idea of a typical sleeping posture for the neonate.⁶¹ She claims, from her observations on 95 infants, not only that there are many individual differences in sleeping postures among them but also that variations are present in the same infant. A commonly occurring posture which she noted is one in which the deeply sleeping neonate has legs and arms flexed and mouth closed. To prevent his muscles from becoming strained and fatigued it is necessary to turn the baby over as he sleeps during the first few months.

Altogether, unless the mother is somewhat of a sentimentalist, her first acquaintance with her offspring may be disappointing. One writer and mother offers this most appropriate description. "He is ridiculously small, very red and often blotchy as to color, curled up absurdly, armadillo-wise, with short bow legs drawn up over a large bulging abdomen; his head is likely to be flattened or peaked or otherwise misshapen from the cruel strictures of birth; his eyes, when they are not tightly closed, roll meaninglessly and without relation to each other, now crossed, now divergent, in their blank unseeing gaze . . . an unfinished and amorphous creature."⁶²

WHAT CAN THE NEWBORN DO?

Some wag has defined a newborn baby as "an alimentary canal, with a loud noise at one end, and no sense of responsibility at the other!" Although this may be a somewhat limited description of neonatal activity, most observers will agree that feeding, crying, and uncontrolled elimination constitute a sizable proportion of an infant's responses. Nevertheless, the neonate shows many reactions in addition to the vital processes just mentioned. It should be recalled that much simple behavior takes place before birth, and it will be seen that, in most instances, early postnatal activity is merely a continuation and extension, on a more mature level, of this behavior. In general, the responses of the newborn infant as well as those of the fetus can be classified into two categories: (1) mass activity and (2) specific movements.

During the first 10 or more days after birth, generalized or mass

⁶¹ I. F. Wagner, "The Sleeping Posture of the Neonate," *Journal of Genetic Psychology*, 1938, 52 235-239.

⁶² J. C. Fenton, *A Practical Psychology of Babyhood* (Houghton Mifflin Company, Boston, 1925), p. 3.

movements predominate.⁶³ When one point on the body of the neonate is stimulated there is a mass response of the entire body. For instance, if an infant's nose is held he responds with generalized movements and not with specific defense reactions. In an investigation of newborn infants, where the nose was held, the neonate drew back the head, arched the back, expressed general restlessness, and made nonspecific body movements.⁶⁴ However, as the nervous system matures, the infant will make specific defensive movements. In checking reactions to cutaneous or skin irritations, one investigator concluded that a reflex withdrawal response and crying accompanied by general bodily activity persist for the first two or three months. During the next three or four months the prevailing reaction is mere crying, and later on come escape and, finally, defense reactions.⁶⁵

In reacting to *sound* stimulations the following movements occurred:⁶⁶

| | |
|--------------------------|-----|
| Extremities | 35% |
| Eyes | 34 |
| General bodily movements | 26 |
| Sound reactions | 3 |
| Facial movements | 1 |
| Head movements | 1 |

Experimental studies show that newborn infants make a surprising number of movements, even in sleep. There are wide individual differences in activity, some neonates making many more movements than others. In a period ranging from 15 to 18 hours, these movements have been estimated to total 10,000 for the least active and 45,000 for the most active, averaging from about 11 to 43 a minute. Even during sleep the newborn are active one-fifth of the time, and when awake about two-fifths. Wet infants are more active than dry ones, and usually activity is greater in the afternoon than in the

⁶³ Irwin, "The Amount and Nature of Activities of Newborn Infants Under Constant External Stimulating Conditions During the First Ten Days of Life," *Genetic Psychology Monographs*, 1930, 8; also Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 3 by Irwin

⁶⁴ K. C. Pratt, A. K. Nelson, and K. Sun, *The Behavior of the Newborn Infant* (Ohio State University Press, Columbus, 1930).

⁶⁵ M. McGraw, *Growth. A Study of Johnny and Jimmy* (Appleton-Century-Crofts, Inc., New York, 1935), p. 114.

⁶⁶ Pratt, Nelson, and Sun, *op. cit.*

morning. After feeding occurs the newborn are very quiet, but become restless and fussy with the approach of their feeding time. Negro infants are said to be less active than whites, and male infants are less active than females. The movements of 78 neonates are distributed as follows:⁶⁷

| | |
|----------------|--------|
| Body movements | 41.55% |
| Head movements | 5.12 |
| Arm movements | 15.15 |
| Leg movements | 30.25 |
| Sounds | 7.93 |

Thus the newborn shows more behavior involving the whole body than he does specific segmental action, because his nervous system is relatively immature and functions from the spinal cord and lower brain centers.

In addition to the mass activity just described, the neonate shows a large repertoire of specific reactions.⁶⁸ We have already noted the birth cry in beginning respiration. Other reflexes, which are necessary for survival, are ready to function at birth or shortly thereafter. These include feeding responses, like sucking and swallowing, and visceral reflexes needed for elimination. The newly born infant can also sneeze, yawn, stretch, cough, hiccup, gasp, turn his head freely from side to side when lying on his back, and open and close his eyes. The Babinski reflex, referred to previously, which is the bending back of the great toe and the fanning or spreading of the other toes when the sole of the foot or the inside of the ankle is stimulated, functions from birth to about six months and is never present, except in abnormal adults, after two years of age. The Darwinian, or suspension-grasp reflex, whereby the infant's fingers can grip an object strongly enough to support its entire weight, is present at birth and is said by some not to function after the fourth month. It is found even in dying babies and those born prematurely. Considerable interest has been associated with this reflex because of the claim that it represents a survival of an ability necessary in the early evolutionary development of man, hence the name "Darwinian reflex." (See

⁶⁷ Hurlock, "Experimental Studies of the Newborn" *Child Development*, 1933, 4:148-163.

⁶⁸ Dennis, "A Description and Classification of the Responses of the Newborn Infant," *Psychological Bulletin*, 1934, 31:5-22, also Carmichael (ed.), *op. cit.*, chap. 4 by Pratt.

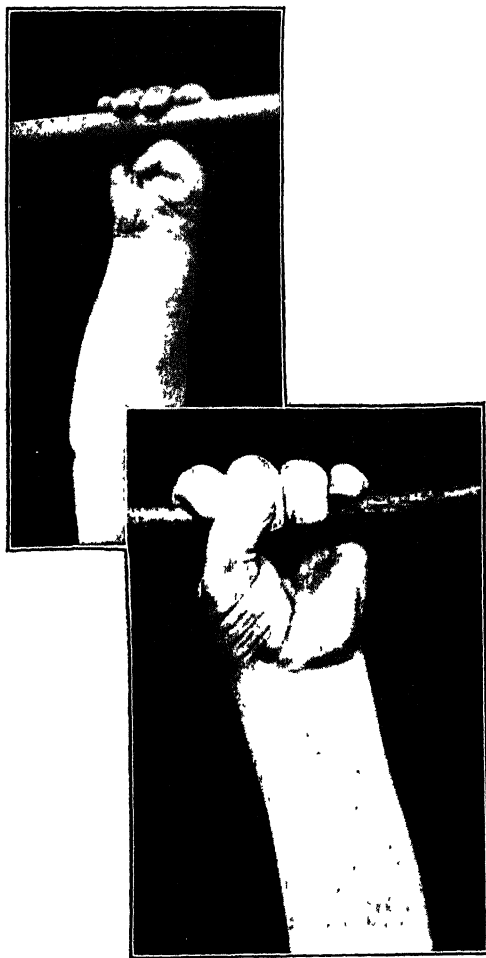


FIG. 17. The Suspension Grasp or Darwinian Reflex. (From *Growth. A Study of Johnny and Jimmy*, 1935, by M. McGraw. By permission of the author and of Appleton-Century-Crofts, Inc., publishers.)

Fig. 17.) A study of this reaction was made around 1891 by a Dr. Robinson, who had become interested in it through reading Bret Harte's story, "The Luck of Roaring Camp," wherein a newborn baby demonstrated his ability to "rattle with Kentucky's finger." Despite much skepticism Dr. Robinson confirmed the presence of this reflex in more than 60 babies.⁶⁹

A more recent experiment was made upon 197 infants to determine whether certain reflexes referred to as "startle" (Moro reflex) or "body jerk" are the same or different behavior patterns in the neonate. In this response the infant throws out its arms and brings them together in a circular movement resembling an embrace, while the legs also show a similar motion. (See Fig. 18.) Results of this research justify the use of one term, "body jerk," which is defined as "any sudden jerk

or tensing of the trunk, plus limb movement." The terms "startle" and "body jerk" in the older literature are now classified under the modern interpretation of "body jerk" or Moro reflex cited above.

⁶⁹ Shinn, *op. cit.*, pp. 26-28.

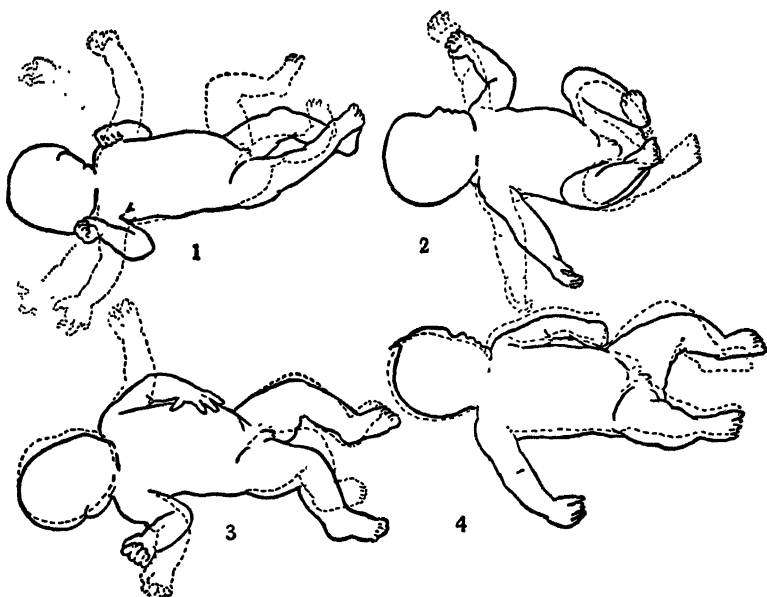


FIG 18. The Moro Reflex. (From *Growth: A Study of Johnny and Jimmy*, 1935, by M. McGraw. By permission of the author and of Appleton-Century-Crofts, Inc., publishers)

The patterns are quite variable and deep inspiration occurs in about two-thirds of the cases. These body jerks take place most frequently in the first few days following birth and during deepest sleep. They are faster than "body stirs," which occur where "a series of movements is relatively slow rather than sudden and jerky"—the limb movements in a body jerk being symmetrical, whereas those in a stir are not.⁷⁰

The Moro reflex, provoked by a sudden noise, and the Babinski, Darwinian, and other reflexes are said by some writers to disappear at about the fourth month, but one investigator shows that they are all simply immature levels in the development of later and more complex behavior patterns.⁷¹ A drawing illustrating the change in the pattern of the Moro reflex is shown in Figure 18.

Various theories have been advanced to explain right- or left-handedness in children. One of these suggests that either the right

⁷⁰ Wagner, "The Body Jerk of the Neonate," *Journal of Genetic Psychology*, 1938, 52.65-77.

⁷¹ McGraw, *op. cit.*

or left arm may be compressed during the last month or two of pregnancy, and since the free arm receives more exercise, it will be the more skillful of the two.⁷² Another theory is that handedness is determined by the direction of the early tonic neck reflex. Rightward t-n-r is much more frequent than leftward, hence the preponderance of right-handed individuals.⁷³ However, experiments made at Ohio State University⁷⁴ show that it is impossible to determine at the time of birth whether an infant will be left- or right-handed. Further discussion of this problem will be found in Chapter 5.

It will be remembered that most of the sense organs have matured sufficiently during the fetal period to function if stimulated. After birth there is not only further sensory development but a great increase in amount and variety of stimulation as well. Sight, which is limited to light perception in the seventh fetal month, has progressed somewhat by the time of birth, but the neonate's field of vision is limited to a few feet directly in front of him. He can react to the brightness in light but not to color. He can fixate upon a light moved within his range of vision but cannot follow it.

Even before birth the fetus is sensitive to either sound or vibration—it has not yet been finally determined which—but at birth may appear deaf because the middle ear is filled with amniotic fluid instead of air.⁷⁵ After this fluid has dried out, however, the baby's hearing should function normally.

The sense of taste in the neonate seems to be better developed than either vision or hearing, but the exact extent of its development is difficult to determine experimentally. We know, however, that the baby accepts sweet tastes and rejects those which are sour, bitter, or salt.

Although the nerve centers for smell mature in the fetal period, there is some disagreement as to how well it functions in the newborn. Experiments show that neonates react to strong odors, but it has been suggested that this response may be due to the irritation of

⁷² R. M. Dorcus and G. W. Shaffer, *Textbook of Abnormal Psychology* (The Williams and Wilkins Company, Baltimore, 1945), p. 92.

⁷³ Gesell, *The Embryology of Behavior*, p. 129

⁷⁴ W. L. Valentine and I. Wagner, "Relative Arm Motility in the Newborn Infant, Part I," *Contributions in Psychology*, No. 12, The Ohio State University, Columbus, 1934, pp 53-68.

⁷⁵ Fenton, *op. cit.*, chap 1; also E. S. Bryan, "Variations in the Response of Infants During the First Ten Days of Postnatal Life," *Child Development*, 1930, 1. 56-77.

the sensitive tissues lining the nasal passages rather than to genuine olfactory discrimination.

The newborn reacts more strongly to temperatures colder than that of his body than to those which are warmer.

Touch sensations are present in all parts of the body at birth, but pain is said to be subnormal and develops first in the anterior or head end. The face of a newborn infant is more sensitive and reacts faster to pain than do the legs. This is accounted for by the fact that the nerves for touch and pain have fewer synapses (where two nerve cells approach each other) in the face and head region than in the extremities. Also, the distance which a nervous impulse is forced to travel is greater to the extremities than to the face and head.

There has been a great deal of controversy as to whether or not the newborn infant experiences definite emotions, and much research has been conducted regarding this problem. Some investigators believed that specific emotional patterns, such as fear, anger, and love, are innate and can be evoked at birth by appropriate stimuli. It seems probable, however, that the startle response and the generalized defensive movements such as those discussed on page 72 were mistakenly thought to be evidences of fear and anger. More recent studies have shown that the emotional reactions of the newborn are vague and nonspecific, taking the form of general excitement, and the neonate may react positively or negatively to satisfying or annoying conditions. Out of this generalized behavior more specific responses of distress and delight are differentiated at the age of about three months. These, in turn, with advancing maturity and experience, become further differentiated into fear, disgust, anger, elation, affection, etc.⁷⁶ A more detailed discussion of emotional development is presented in Chapter 9.

CAN THE NEWBORN LEARN?

We usually think of learning as the acquisition of complex skills or knowledge, and in this sense, of course, the newborn baby is too immature to learn. There is, however, a very simple form of learning, known as conditioning, which is characteristic of both man and animals. In conditioning "a response ordinarily connected with one situation becomes associatively attached or conditioned to a wholly

⁷⁶ K. M. B. Bridges, "Emotional Development in Early Infancy," *Child Development*, 1932, 3:341-342.

different situation." Let us suppose, for example, that just before a dog is fed a bell is rung. After this is done a number of times in exactly the same way, the dog will associate the sound of the bell with feeding and will appear whenever he hears the bell. We say, then, that the dog has become conditioned to, or has learned to respond to, the sound of the bell. Some attempts have been made to establish conditioned responses in human fetuses by applying vibratory stimuli to the mother's abdomen, but so far these experiments have been unsuccessful.

Some Russian psychologists believe that conditioned reflexes cannot be established in infants under the three- to five-month level, but an American woman claims to have been successful in conditioning the food-taking response in neonates to the sound of a buzzer.⁷⁷ In this experiment the babies in question were presented with their bottles just prior to the sounding of a buzzer. The problem was to ascertain whether the baby would make feeding responses when the buzzer sounded but the bottle was withheld. This was accomplished, although the responses were somewhat unstable.

Another investigator conducted a series of experiments to determine whether conditioned responses could be established in neonates.⁷⁸ In the first series a flash of light, which would naturally produce eyelid closure, was associated with the tactual stimulus of a vibrator placed under the infant's body. In the second series an auditory stimulus was associated with a mild electric shock applied to the baby's foot, resulting in leg withdrawal. The third experiment was concerned with the conditioning of feeding responses to the sound of a buzzer, similar to that described above. The results showed that definite conditioning of eyelid closure to the vibrator occurred by the eighth day of postnatal life, after six days of experimentation, and in one infant as early as the fifth postnatal day, after three days of experimentation. Conditioning of leg withdrawal to an auditory stimulus was more difficult, although it did occur in three out of five cases. Attempts to condition the feeding responses, however, were unsuccessful, and the investigator criticizes previous re-

⁷⁷ D. P. Marquis, "Can Conditioned Responses Be Established in the New-Born Infant?" *Journal of Genetic Psychology*, 1931, 39 479-492.

⁷⁸ M. A. Wenger, "An Investigation of Conditioned Responses in Human Infants," *University of Iowa Studies in Child Welfare*, Iowa City, Iowa, 1936, 12:8-90, Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 5 by Wenger, Carmichael (ed.), *op. cit.*, chap. 4 by Pratt.

search upon this problem for failure to use exact recording apparatus and more objective methods of observation.

Although other experiments,⁷⁹ also, have demonstrated the possibility of establishing conditioned behavior in newborn infants, doubt has been expressed as to the value of this work.⁸⁰ Such responses are exceedingly difficult to obtain, requiring many repetitions of the natural and conditioned stimuli, and are very unstable. There are also wide individual differences in the susceptibility of infants to conditioning. Furthermore, the necessity of conducting most research of this type in hospitals makes it impossible to check the persistence of the responses after the child has been taken home.

Since the nerve tracts in the neonate are immature, it is not surprising that he has little mental integration. The cerebral cortex probably does not function sufficiently in the neonate to enable him to coordinate his activities. Furthermore, there is still much debate concerning the extent of cortical functioning in the newborn. It is believed by some that the cortex is involved in conditioning, while others claim that conditioned responses may be subcortical in nature. Present evidence indicates that the development of cortical function progresses slowly as the infant matures. Significant individual differences, however, are present, thus making generalizations upon this point difficult. It may be concluded, therefore, that the possibility of simple learning in the neonate is limited, and that such conditioning as may be secured is of little permanent value.

SUMMARY

A knowledge of prenatal life is fundamental to the understanding of later development. Although most of our information concerning embryology is derived from the study of lower life forms, extensive research has been done upon human fetuses.

The length of the prenatal period depends upon a number of factors, but it is usually around 280 days.

Generally, prenatal development is divided into three stages: (1) the germinal, (2) the embryonic, and (3) the fetal. The "egg-like" appearance of the individual during the germinal period gives

⁷⁹ See M. W. Curti, *Child Psychology* (Longmans, Green and Company, New York, 2nd ed., 1938), pp. 213-226.

⁸⁰ D. D. Wickens and C. Wickens, "A Study of Conditioning in the Neonate," *Psychological Bulletin*, 1939, 36.599.

way to a more human-looking form in the embryonic stage of development.

Tremendous growth takes place during the embryonic period. At its beginning, structures are formed for the nourishment and protection of the developing individual; the heart begins to beat; and the bases of the nervous system, skeleton, and vital organs are established. In both structure and function embryonic growth follows two fundamental laws: (1) development in a head-foot direction and (2) development from the trunk outward to the periphery of the body.

Many hazards exist for the individual before birth, and abnormalities may arise during the first two months. These are not caused by maternal impressions but are the result either of defective genes or of irregularities in growth.

The fetal period is the last stage of prenatal life and in it the individual is prepared for birth. Growth continues at a rapid pace and *true* behavior begins. The first *real* movements occurring early in the third month are responses to external stimulation, and a little later spontaneous movements of the same nature take place. It will be the fifth month, however, before such movements are strong enough to be perceived by the mother. The fetus is now equipped with a variety of specific reflexes which are ready to function at birth. All these reactions, however, whether generalized or specific, are products of maturation and are probably governed, not by the cortex, but by the neural centers of the spinal cord, the medulla, and the lower brain centers. Sensory mechanisms are fairly well developed and will function if there are adequate stimuli to elicit them.

There has been much controversy over whether generalized movements or specific reflexes occur first in the development of fetal behavior. Present evidence seems to favor the hypothesis that, with some exceptions, mass reactions usually precede specific responses.

Birth is merely an incident in the developmental process, but it is one of the most severe ordeals which the individual must experience. There are several methods of delivery; the most common and generally the safest for the baby is vertex presentation. The average infant requires from ten days to a month to recover from birth shock and to adapt to his new environment.

Sometimes the unfinished appearance of the newborn shocks the sensitive or sentimental parent.

The neonate sleeps a great deal of the time, and much discussion has arisen over his typical sleeping position. Present evidence, however, seems to indicate that there is no one typical sleeping posture. There are wide individual differences among infants, and even in the same infant.

Behavior in the neonate is a continuation of the kinds of activities which occurred during the latter part of the fetal stage; i.e., both mass and specific responses take place.

Although various theories have been advanced about right- and left-handedness, it is impossible at birth to determine the dominant hand.

Sensory development has progressed somewhat but is still immature, especially vision.

The newborn shows generalized excitement and may respond positively or negatively to satisfying or annoying conditions. However, he has not yet developed any specific emotional patterns.

It is possible to establish conditioned responses in some neonates, but they are usually unstable, and it is not yet clearly known how significant this process is in development.

Although the baby's vital processes are functioning, his sense organs are operating within restricted limits, his motor equipment is meeting his needs, and his chief defense mechanism—crying—is well developed, he has no understanding of the world about him because his nervous system is still immature.

SUGGESTED ACTIVITIES

1. Secure permission from the Department of Biology in your college or university to observe embryos and fetuses of both animals and humans in various stages of development.
2. Report on cases (withholding names) of abnormalities, such as hare-lip and cleft palate, which you may have observed personally or have read about in the press or magazines.
3. Report to the class (withholding names) any instances of babies born prematurely or postmaturely, or any unusual types of births which you know of personally or about which you may have read.
4. Appoint a small committee from your class to secure permission from a local hospital to observe and report upon the appearance, sleeping posture, and types of movements made by the neonate.
5. Report any cases (withholding names) of birthmarks of which you may know, and the explanations offered by the parents to account for

them. What, if any, were the psychological effects of these marks upon the individual concerned?

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CHAPTER 4

HOW OUR BODY STRUCTURE AND FUNCTIONS DEVELOP

WHAT IS THE GENERAL NATURE OF GROWTH?

In the preceding chapter we outlined development from conception through the first month of postnatal life. It will be recalled that growth during the embryonic and fetal periods was tremendous, the individual developing from a mere speck to an average birth weight of between 7 and 8 pounds and ranging from 20 to 21 inches in length. Even during the prenatal period, however, the rate of growth begins to slow down.

Between the end of the first month and the end of the second month the fetus multiplies its length about twelve times; during the third month the fetal length still trebles, while during the fourth month the length is only doubled, and in the eighth month the increase in length is scarcely one-seventh beyond that at the beginning of the month. This decreasing rate of growth during fetal life suggests the form of growth curve that continues during the first years after birth. If the individual grew in the months and years succeeding birth with the same average *absolute* increments per month as between the sixth month of fetal growth and birth at nine months, he would still become at the age of twenty years a monster of fifty-five feet tall.¹

In general, then, the rate of growth from infancy to maturity is much slower than during the prenatal period. There are, however,

¹ From W. F. Bruce and F. S. Freeman, *Development and Learning* (Houghton Mifflin Company, Boston, 1942), pp 31-32. With permission of Henry Holt and Company, Inc., New York, present holders of the copyright.

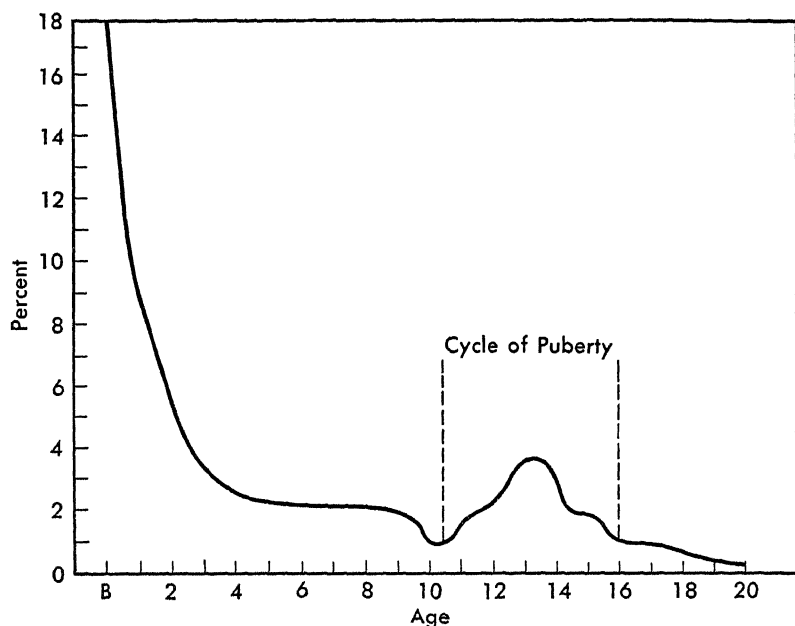


FIG. 19. Schematic Growth Curve of Boys from Birth to 20 Years (after Dr. H. R. Stolz.) Percent increase is shown for each six months. Decline in growth rate is shown by a drop in the curve, whereas a rise in the curve indicates acceleration. (Reprinted from *Development and Learning* by W. F. Bruce and F. S. Freeman. Published for Reynal and Hitchcock by Houghton Mifflin Company. By permission of Henry Holt and Company, Inc., present holder of the copyright.)

significant changes in growth rate during the years from birth to the end of the second decade. These changes may be represented graphically in the form of a curve. (See Fig. 19.) From this curve it will be seen that growth is still relatively rapid during infancy and early childhood, is slower but constant in middle childhood, becomes accelerated just prior to puberty, and finally tapers off during adolescence.

It should be emphasized that a single curve is purely hypothetical and can serve only to illustrate roughly the general nature of growth. Actually, growth is a many-sided process, involving different rates of development for various body structures. For instance, the skeleton, neuromuscular system, endocrine glands, heart, and blood vessels all have their own growth rates, no two of which may be alike. If one

wished to envisage growth as a whole, therefore, it would be necessary to construct curves for each body structure rather than attempt to combine *all* phases of growth into a *single* curve. Olson and Hughes² have suggested that various physical measures may be converted into a common denominator of age units, the average of which could represent the individual's organismic age at a particular point in time. In this way height, weight, eruption of teeth, strength of grip, etc., can each be reduced to age values and referred to as height ages, weight ages, dental ages, and grip ages. These, in turn, are combined and compared with the particular child's chronological age. The authors warn, however, that age units should not be used as norms or standards for different dimensions of growth which children are expected to reach. Their value lies in furnishing a common denominator which indicates roughly whether or not a given individual has achieved a superior, average, or inferior adjustment within his age group.

Although we are interested in the total process of development, for the sake of convenience and clarity we shall consider some of the main aspects of growth separately. It must be borne in mind constantly, however, that all phases of growth are continuous and take place concurrently. For example, the individual's skeleton does not grow on one particular day, while the rest of his structure lies dormant, nor does his nervous system develop at one time and his muscles at another; but all are developing at the *same* time, each in its own way and at its own rate.

In this chapter we shall discuss some of the anatomical and physiological aspects of growth; motor development will be considered in the following chapter. We shall include under anatomical development such phases as height and weight, body proportions and contours, eruption of teeth, and the mineralization of bones. Under physiological growth we shall discuss pulse rate and blood pressure, digestive processes and metabolism, and the functions of the principal endocrine glands.

It should be emphasized, too, that growth is a profound psycho-

² Barker, Kounin, and Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 12 by W. C. Olson and B. O. Hughes, also mimeographed manual, "Tables for the Translation of Physical Measurements into Age Units," University Elementary School, Ann Arbor, Michigan, 1938. The authors have expressed their willingness to supply a practice exercise upon request to anyone interested in using their technique.

logical experience, both for the developing individual and for those with whom he comes in contact. Variations in size and strength, awkwardness, and early or late sexual maturation may influence greatly the social adjustment of the growing boy or girl. The undersized or underdeveloped child finds it difficult to achieve status among his peers, while the overgrown or awkward child often is regarded as a nuisance, both by his age mates and by adults. Moreover, as we indicated on page 13, society expects the individual to conform to certain standards of behavior at varying age levels, and if he is unable to do this, he tends to be regarded as maladjusted. For this reason, the purely physical aspects of growth cannot be separated from the individual's total development, and if we are adequately to understand the growing boy or girl as a whole personality, we must have some knowledge of these physical factors.

GROWTH IN HEIGHT AND WEIGHT

When we speak of a "growing child," we usually think of variations in his height and weight, because these are among the most obvious developmental changes. Although height and weight still are considered to be fairly satisfactory indexes of physical development, there are, as we shall see, more subtle growth changes which are equally important.

For some time it has been customary to compile so-called height-weight tables, which are supposed to indicate what the height and weight of an individual at a given age should be. Most of these impressive-looking tables have been derived from data obtained by the cross-sectional technique discussed on page 20. By this method the investigator measures the height and weight of large groups of children at different age levels and uses the average of each age group as a norm or standard. For example, the height and weight of each child in a large group of six-year-olds are computed. These measurements are then averaged, or the mid-point in the series is found, and the resulting figures are taken as height and weight norms for six-year-olds. These tables, if used with understanding and discrimination, may be of considerable value in showing how the growth of an individual child compares roughly with that of others in his age group. Undoubtedly, however, they have been taken too seriously by many parents and teachers who have mistakenly supposed that there is a definite height and weight to which every child of a cer-

tain age must conform. Consequently, some children have been overfed, while others have been undernourished, because they were believed to be too small or too large for their age.

On page 22 we called attention to the fact that the cross-sectional technique obscures individual differences, and these are especially important in relation to growth in height and weight. In practically all phases of growth there are important sex differences which are not apparent if both sexes are included in a cross-sectional survey. Because of this, it is customary to compute separate norms for boys and girls. Even with the separation of the sexes, there are other important individual variations which should be taken into account. For example, height and weight are greatly influenced by racial stock, and standards derived from children of relatively homogeneous racial backgrounds might be quite different from those secured from samples of more diverse origins.³ Even within the same ethnic group there are wide individual differences in height and weight, hence a child's hereditary antecedents may greatly influence these aspects of his growth. Nutrition, amount of sleep, and exercise also exert a profound effect upon development, and these factors, in turn, are closely related to the family's socioeconomic status. Thus, it has been shown that Iowa children who came from homes where the father belonged to the professional or managerial class exceeded impoverished children from Alabama in body size, and that white boys from professional groups are larger than those from unskilled groups.⁴

Height-weight tables are subject, also, to certain errors made inadvertently by the most careful investigators. In an extensive growth survey⁵ considerable variation was found in the measurements obtained on the same individual by different investigators, as well as in the measurements made by the same investigator upon the same individuals at different times. Results are affected, also, by the method used in calculating how old the child is, i.e., whether his exact age is used, or his age to his nearest birthday. These, and similar factors, probably account for the wide discrepancies in the height-weight standards for particular ages found by different research workers.

³ P. L. Boynton, *Psychology of Child Development*, pp. 106-107.

⁴ V. C. Ames and C. D. Flory, "Physical Growth from Birth to Maturity," *Review of Educational Research*, 1944, 14.427-437

⁵ W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development*, pp. 60-63.

This lack of consistency is strikingly illustrated by Boynton's comparison of the findings of seven leading investigators.⁶ For instance, there is a variation in the norms for 6½-year-old boys of almost 4 inches in height and 7 pounds in weight, and for 11½-year-old boys of 4½ inches in height and 15 pounds in weight. Because of discrepancies of this sort, Boynton suggests that if height-weight tables are used to judge the normality of a child's growth, standards be employed which show the range within each age level. A child would not be considered abnormal, therefore, unless his height and weight fell within the highest or lowest 10 percent of his age group.⁷ In the final analysis, however, an individual's height and weight must be evaluated according to his own particular biological norm. It is more important for his growth to be consistent with his own pattern than that it conform to the pattern of other children of the same age.

Notwithstanding the wide variations just discussed, it is possible to observe general trends in the course of development in height and weight, and to reach certain conclusions regarding these aspects of

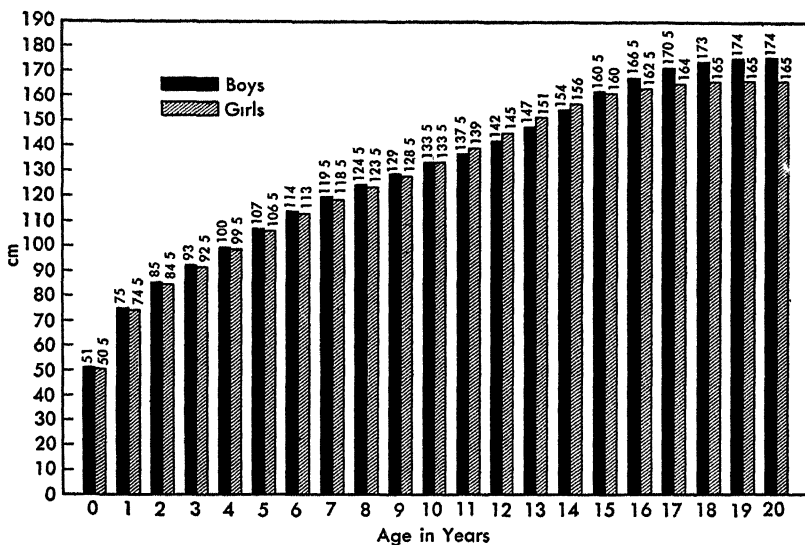


FIG. 20. Growth in Stature from Birth to 20 Years (after Pfuhl). (Reprinted from *Adolescence. Forty-Third Yearbook of the National Society for the Study of Education*, Part I, 1944, N. B. Henry, ed., chap. 2 by W. W. Greulich, p. 10. By permission of the Society.)

⁶ Boynton, *op. cit.*, pp. 100-105.

⁷ *Ibid.*, p. 107.

growth. Figure 20 shows growth in stature from birth to 20 years for each sex.⁸ It will be noted that boys are somewhat taller than girls at birth, and maintain this slight superiority until around 10 years of age, when both sexes are approximately equal. From 11 through 14 years the girls are taller, but from then on the boys forge ahead and are never again excelled by the girls.⁹ This is not always the case, however, as one sometimes sees a very tall woman and an unusually short man, but this is the exception rather than the rule.

During the first year after birth the average child increases his height eight to ten inches,¹⁰ whereas he grows only about four inches during the second year.¹¹ By the age of 4 years, however, it is estimated that girls have gained 60 percent of their total height, and boys 57 percent.¹² From the ages of about 6 to 12 the increase is only around 5 or 6 percent each year.¹³ This probably accounts partly for the fact that children seem more alike at this period than at any other stage in their development. Although there are wide individual differences in the exact age at which puberty occurs, girls usually mature about two years sooner than do boys and consequently show an earlier prepubescent growth spurt. Despite this earlier acceleration in height, girls reach approximately their adult stature at about 16 years, while boys continue their growth to 18 and beyond. These growth differences are well illustrated in Figures 21 and 22, which give a comparison of the stature of boys and girls from 5 to 17 years. The close relationship between the anatomical and physiological phases of development is shown by the fact that tall children usually reach puberty earlier than do short children,¹⁴ although there may be exceptions to this generalization. At this point we may note, also, that children who mature early usually show a very rapid growth rate during the prepubescent and early adolescent years. Thereafter, growth slows down markedly, and the adult height of the early-maturing boy or girl may be somewhat less than that of individuals

⁸ A centimeter is $\frac{1}{100}$ of a meter or 0.3937 of an inch.

⁹ N. B. Henry (ed.), *Adolescence*, chap. 2 by W. W. Greulich

¹⁰ L. R. Schulz and M. S. Smart, *Understanding Your Baby* (The Sun Dial Press, Detroit, 1942).

¹¹ Bruce and Freeman, *op. cit.*, p. 30

¹² L. H. Meek, *Your Child's Development and Guidance Told in Pictures* (J. B. Lippincott Company, Philadelphia, 1940), p. 9.

¹³ F. D. Brooks, *Child Psychology* (Houghton Mifflin Company, Boston, 1937), p. 109

¹⁴ Dearborn and Rothney, *op. cit.*, p. 39.

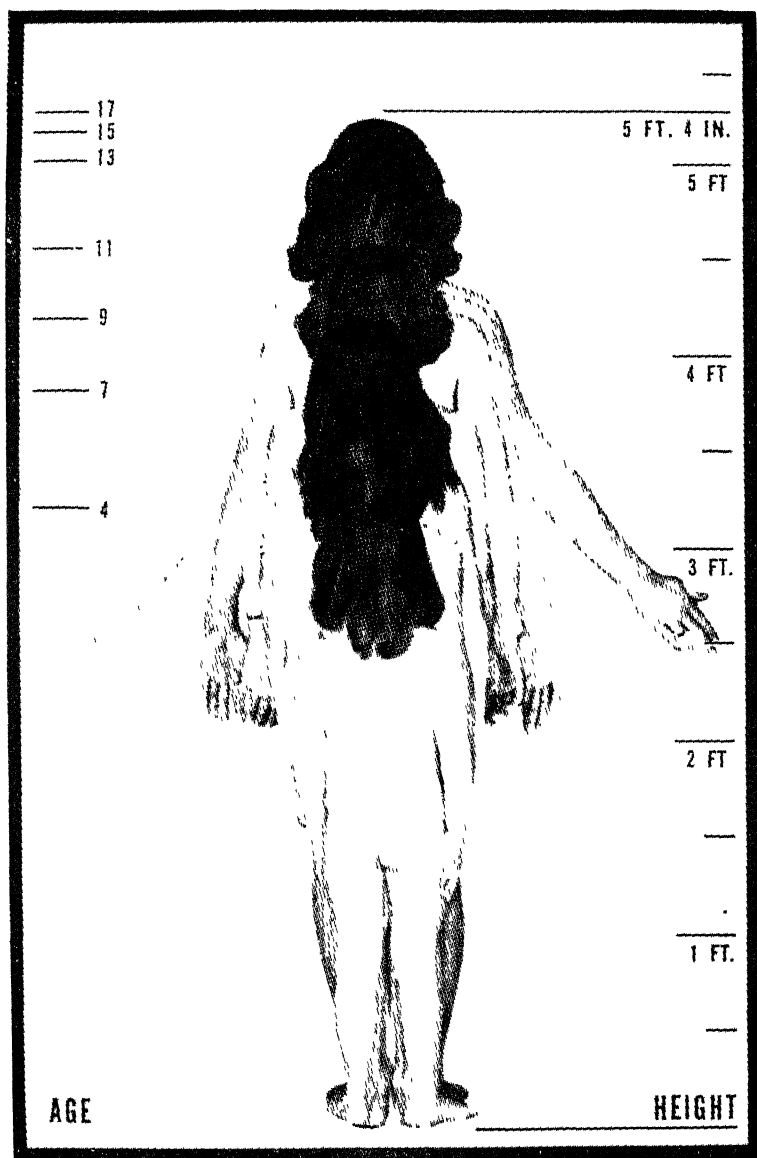


FIG 21. Growth Rate of a Normal Girl as Seen in a Set of Superimposed Pictures (Reprinted through the courtesy of Dr Nancy Bayley, Institute of Child Welfare, University of California, Berkeley.)

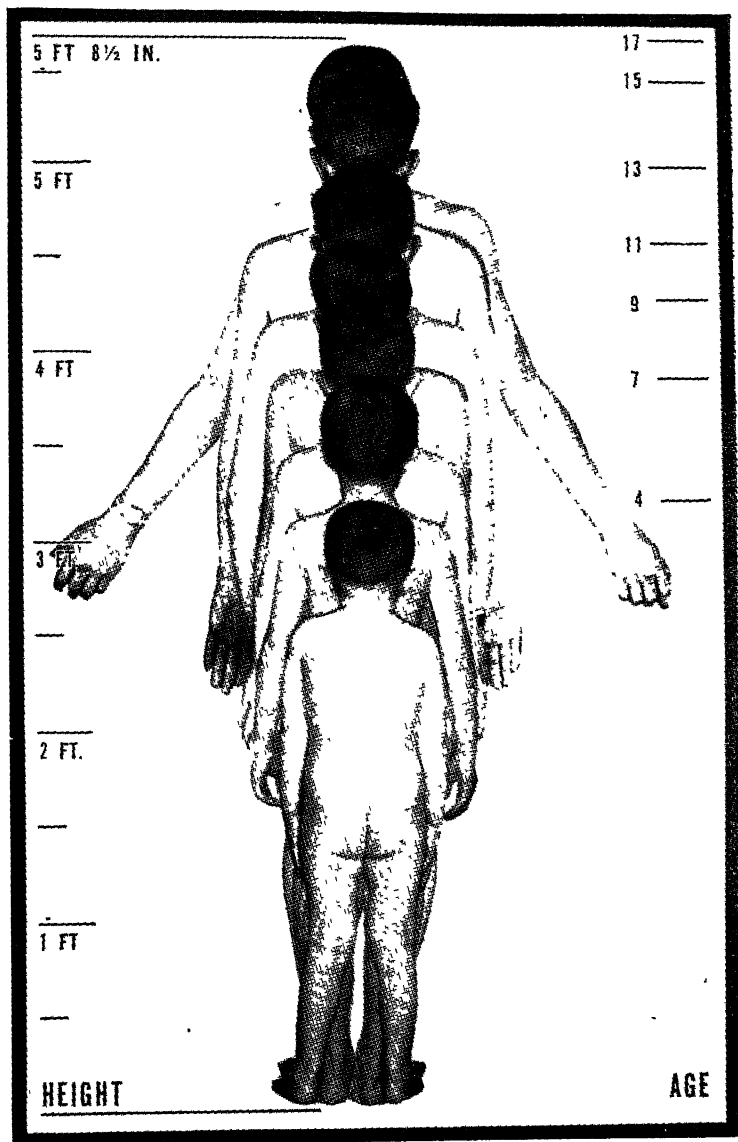


FIG. 22. Growth Rate of a Normal Boy as Seen in a Set of Superimposed Pictures. (Reprinted through the courtesy of Dr. Nancy Bayley, Institute of Child Welfare, University of California, Berkeley.)

who reach puberty later. Conversely, children who mature late may, for a time, seem less well developed than others of the same age who have matured earlier. Their growth, however, is steadier and continues longer, so that their adult height may exceed that of the early maturers.

Within recent years attempts have been made to use the physical measurements of children as a basis for predicting their future height and body proportions. The accuracy of these predictions depends upon the regularity of the child's growth processes as well as upon the possibility of distinguishing characteristic growth patterns for different types of individuals.

It is interesting to note that more studies have been made upon weight increases during childhood than upon growth in stature. This doubtless is due to the fact that weight probably is the best single index to nutrition and consequently is a good indication of the child's health. Nevertheless, height is considered to be a somewhat better measure of general growth than weight, because the latter is affected more by environmental conditions.

The average infant who weighs between seven and eight pounds at birth doubles this weight by the end of the fifth month. Thereafter, weight gains become relatively smaller as the child approaches the end of the first year. Around six months the average gain is down to four ounces a week or a pound a month, and during the last quarter of the first year the average monthly gain has diminished to about two-thirds of a pound, or two to three ounces a week. This decreasing growth in weight continues into the second year, wherein the gain approximates half a pound a month.¹⁵ After the second year the rate of gain in weight continues to decline and between the ages of 5 and 11 years is only slightly greater than 10 percent a year.¹⁶ Until the age of 9 or 10 the average boy is somewhat heavier than the average girl, but the variations within each sex are greater than those between the sexes. As in the case of height, girls enter the prepubescent spurt earlier than do boys, and during this time they exceed the boys in weight. This continues until the early years of adolescence, when the boys overtake the girls and remain heavier throughout adulthood. The weight gain for both sexes during pu-

¹⁵ B. Spock, *Baby and Child Care* (Pocket Books, Inc., New York, 1946), p. 107.

¹⁶ Brooks, *op. cit.*, p. 113.

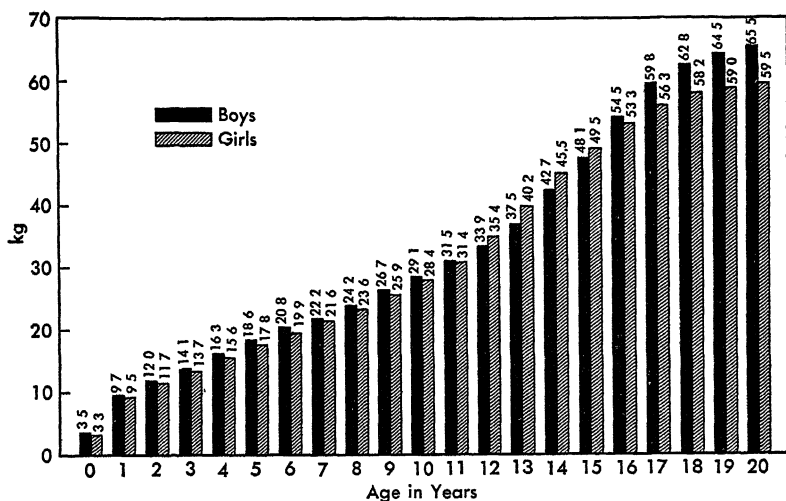


FIG 23 Growth in Weight from Birth to 20 Years (after Pfuhl) (Reprinted from *Adolescence Forty-Third Yearbook of the National Society for the Study of Education*, Part I, 1944, N. B. Henry, ed, chap 2 by W. W. Greulich, p. 11. By permission of the Society)

berty and adolescence is due primarily to the growth of the skeleton rather than to the accumulation of fat under the skin.

A comparison of Figure 23, showing the increases in weight¹⁷ for boys and girls from birth to 20 years, with Figure 20 showing height increases, reveals that the weight gain for girls in early puberty is greater than their gain in height. At 15 the boy is taller than the girl, but the latter is heavier.

It will be seen that, despite small variations, the courses of development in height and weight are strikingly similar. However, the total growth for stature is considerably less than that for weight. During the first two decades height increases nearly $3\frac{1}{2}$ fold, while body weight increases fully 20 fold.¹⁸

CHANGES IN BODY PROPORTIONS AND CONTOURS

Among the most interesting aspects of growth from birth to maturity are the changes which take place in body proportions and

¹⁷ A kilogram is a unit of weight equal to 1000 grams or 2.2046 pounds avoirdupois.

¹⁸ J. A. Harris, C. M. Jackson, D. G. Paterson, and R. E. Scammon, *The Measurement of Man*, chap. 4 by Scammon, especially p. 184.

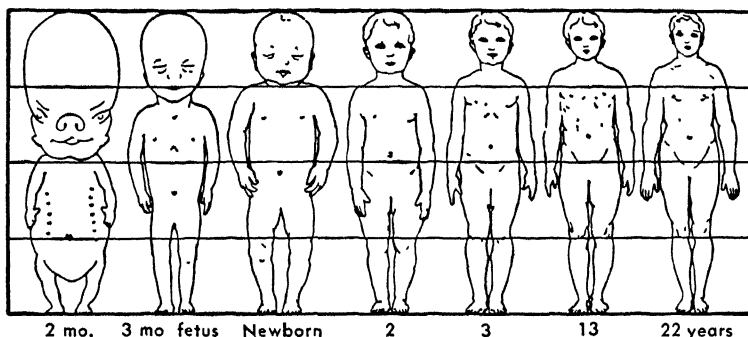


FIG 24 Changes in Body Proportions from the Fetal Stage to Adulthood (after R. E. Scammon). (Reprinted from *Developmental Anatomy* by L. B. Arcy. By permission of W. B. Saunders Company, publishers.)

contours. As was noted in the preceding chapter the head attains a large part of its growth during the prenatal period and at birth represents about one-quarter of the total body length, whereas in the adult it is only about one-tenth of the body length. It grows rapidly in both length and breadth during the first two postnatal years, and then more slowly, but at the age of 5 it has attained about 91 percent of its adult length. At 10 years the head is 95 percent of its mature length, and by 15 years it has practically reached adult size.¹⁹ Figure 24 shows this clearly, as well as changes in other body proportions.

It will be seen that, following the general law of head-to-foot development referred to previously, the head and the parts of the body nearest it reach their maximum growth sooner than do the parts more distant from it. Because of this, the relative rate of growth during childhood and adolescence is necessarily slow. In fact, it is much slower than height, weight, and length of arms or legs.²⁰

The upper portion of the face attains nearly its maximum growth between birth and six years, but the lower part continues to change until maturity. Development of the lower face is closely related to the eruption of the teeth (as we shall see in the next section), as well as to the rapid growth of the lower jaw which usually occurs during puberty and adolescence.

The small child has a relatively low forehead, snub nose, and a chin which recedes slightly. The mature individual, however, has a

¹⁹ L. Carmichael (ed.), *Manual of Child Psychology*, chap. 5 by H. Thompson, especially p. 277.

²⁰ Brooks, *op. cit.*, p. 118.

higher and wider forehead, a longer and bigger nose, fuller lips, and a slightly jutting chin.²¹ In general, the contour of the adult male face is more rugged than that of the female. The man's jaw lines are sharper and the chin is squarer, whereas the woman's face is more oval, less angular, and its expression is less harsh.

If, as sometimes happens, the growth of different parts of the face during adolescence is uneven, an unusual appearance may be produced temporarily. The nose may seem abnormally large, or the chin may be unusually prominent, much to the discomfiture of the individuals concerned. However, if facial development is accelerated and regular, boys and girls may be quite proud of their adult looks.

Striking changes also occur in general body contour during the first two decades of life. The infant has a chubby body his first year, after which his form becomes more slim and boyish. The trunk is relatively long at birth, grows rapidly for a while, and then does not increase much in length until the approach of adulthood.²²

The limbs of the newborn are relatively short, the legs constituting only about three-eighths of the body length. From birth to maturity they increase almost five times²³ and by adulthood are equal to about half the total body length. Most of this growth in leg length occurs just before puberty and during early adolescence, accounting in part for the awkwardness frequently observed at this age.

Sex differences in body contour are not apparent during infancy and childhood, but with the coming of puberty the characteristic male and female forms begin to appear. Reference to Figures 21 and 22 shows that the straight leg lines of the girl in childhood have become noticeably curved by the age of 15. Her hips, also, have grown much wider, owing to the enlargement of the pelvic girdle, while her shoulders have remained relatively narrow.²⁴ This increase in the size of the pelvis is obviously to prepare the girl for motherhood, and is part of her normal development. Sometimes, however, adolescent girls do not understand the reason for their broadening hips and try to reduce by unwise dieting and medication. In contrast to the girl, the boy's shoulders become broader, while his hips remain narrow. Usually the early-maturing boy has broader hips and

²¹ L. Cole, *Psychology of Adolescence*, p. 39

²² L. Carmichael (ed.), *op cit*, pp 266-268; Brooks, *op cit.*, p. 119.

²³ M. E. Breckenridge and E. Lee Vincent, *Child Development*, p. 239.

²⁴ Boynton, *op. cit.*, p. 121.

narrower shoulders than the late-maturing boy, so that his figure appears somewhat more feminine. Some curvature may be observed in the lines of his legs, but it is not nearly so pronounced as in the case of the girl. The legs and arms of the adult male, too, usually are longer than are those of the female.

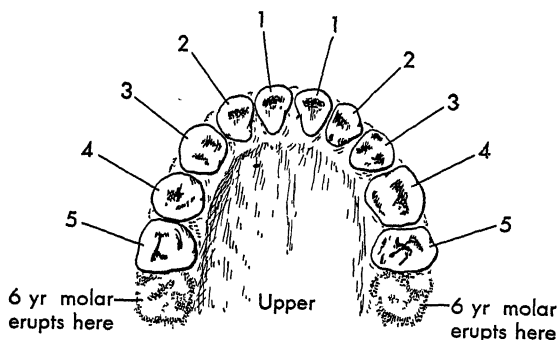
We see, therefore, that the individual undergoes marked changes in body proportion between birth and maturity. From a chubby infant with very short limbs he becomes a child whose trunk is still relatively larger than the length of his arms and legs. As puberty approaches, the growth of arms and legs is greatly accelerated, so that adult proportions are attained, and the characteristic mature body shape for each sex becomes differentiated.

THE ERUPTION OF TEETH

Unlike other phases of growth, dentition is unique in that two sets of teeth erupt in the development of every normal individual. It is a feature of growth, too, which concerns parents greatly. Who has not heard the fond father or mother boasting over the appearance of the child's first tooth, or expressing grave anxiety over the problem of teething!

Sockets for the teeth are formed in the third fetal month, and by birth all the temporary teeth are present in the baby's gums.²⁵ Usually they do not begin to erupt until around six months of age, but occasionally a child is born with teeth already cut. An instance of this occurred some time ago in Charleston, West Virginia, when a baby girl was born with two lower front teeth. Even more remarkable is the case of a Negro girl born in Raleigh, North Carolina, who had a full set of teeth, both upper and lower. She was 32 inches long, weighed 25 pounds, and was the twelfth child in the family.²⁶ Figure 25 shows the time at which the 20 temporary teeth normally erupt. Although girls are ahead of boys in this early dentition, separate standards are not given because the differences between the sexes are relatively small. It will be seen from the norms given in Figure 25 that the lower front tooth usually is the first to appear. The others generally follow in a front-to-rear sequence. Eight teeth usually erupt during the first year, and as a rule all 20 are complete within the second or third year. As an index of development, the sequence in which teeth appear is more important than the exact age at which

²⁵ Meek, *op. cit.*, p. 32.



Temporary Teeth

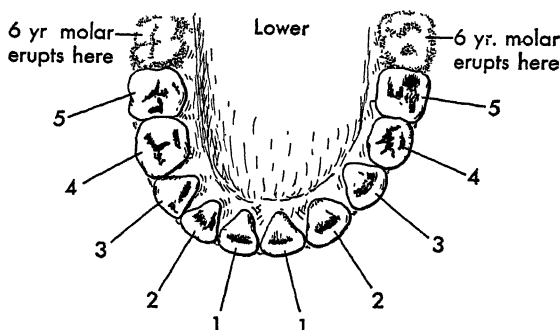


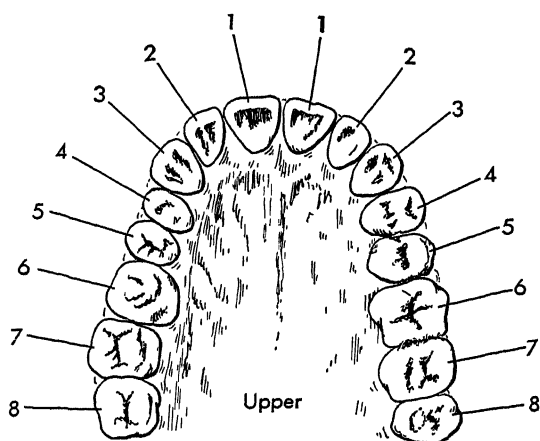
FIG. 25. Diagram Showing the Usual Time of Eruption of the Baby Teeth.

| Tooth | Lower Jaw | Upper Jaw |
|---------------------------------|------------|-------------|
| 1. Central Incisor | 6-8 months | 8-12 months |
| 2. Lateral Incisor | 12-16 " | 8-12 " |
| 3. Cuspid (Canine or Eye Tooth) | 18-20 " | 18-20 " |
| 4. First Molar | 12-16 " | 12-16 " |
| 5. Second Molar | 24-32 " | 24-32 " |

a child cuts a particular tooth.²⁷ Like other phases of growth, dentition is affected greatly by dietary and other environmental conditions, so that every child does not conform strictly to a given set of standards. There are wide differences, also, in the standards used by various investigators.²⁸

²⁷ Breckenridge and Vincent, *op. cit.*, p. 247

²⁸ V. O. Hurme, "Standards of Variation in the Eruption of the First Six Permanent Teeth," *Child Development*, 1948, 19 213-231.



Permanent Teeth

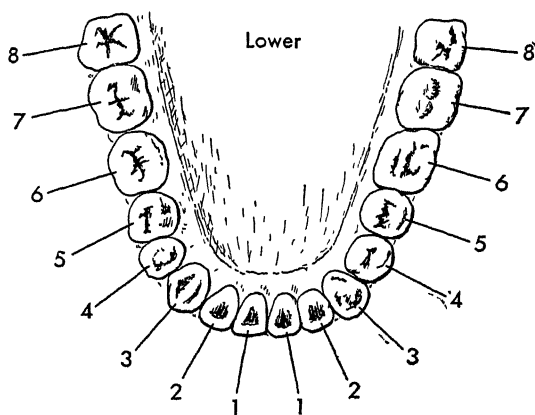


FIG. 26. Diagram Showing Usual Time of Eruption of Permanent Teeth.

| Tooth | Lower Jaw | | Upper Jaw | |
|----------------------------------|------------|------------|------------|--------------|
| | Boys | Girls | Boys | Girls |
| 1. Central Incisor | 6 yrs 4 mo | 6 yrs 1 mo | 7 yrs 2 mo | 7 yrs. 0 mo. |
| 2. Lateral Incisor | 7 " 6 " | 7 " 2 " | 8 " 8 " | 7 " 11 " |
| 3. Cuspid or Canine | 10 " 5 " | 9 " 10 " | 11 " 6 " | 10 " 10 " |
| 4. First Bicuspid | 10 " 10 " | 10 " 2 " | 10 " 5 " | 10 " 2 " |
| 5. Second Bicuspid | 11 " 4 " | 10 " 11 " | 10 " 10 " | 10 " 10 " |
| 6. First Molar | 5 " 11 " | 5 " 11 " | 6 " 1 " | 6 " 0 " |
| 7. Second Molar | 12 " 6 " | 11 " 5 " | 12 " 11 " | 12 " 2 " |
| 8. Third Molar (Wisdom Teeth) | 17-25 yrs. | 17-25 yrs. | 17-25 yrs. | 17-25 yrs. |

The permanent teeth begin with the appearance of the six-year molar, which forms the keystone of the dental arch. Most children have little difficulty in shedding their deciduous teeth, since the roots are absorbed by the jaw and only the crowns are discarded. For the average child this process of exfoliation requires about seven years, and it is not until he is 12 or 13 that he has acquired practically all of his 32 permanent teeth. Figure 26 shows the usual order of their appearance. The eruption of the wisdom teeth is extremely variable, but if they develop at all, it is usually between 17 and 25 years of age. With the exception of the first, or six-year, molar, the sequence of eruption in the permanent teeth is the same as that of the temporary set. In the appearance of permanent teeth, however, girls are so markedly advanced over boys that separate standards are given for the two sexes.

Since the baby teeth are only temporary, there is a mistaken conception that good care of them is unnecessary. This is unfortunate, because the child's remaining teeth are forced to take over the work of any which come out too soon. If too many of the deciduous teeth are lost prematurely, the lower jaw may be shortened, and the child may give the appearance of being a mouth breather. Furthermore, the permanent teeth may be seriously crowded and may come in crooked, resulting in permanent malformation of the jaw. Under these conditions the upper and lower teeth do not meet properly, so that there is interference with normal "bite" or occlusion, and unnecessary strain is put on teeth and jaws. To prevent this, children with crooked teeth often are required to wear braces or bands in an attempt to straighten them. This is a slow and painful process and may be most embarrassing to the individual concerned, especially if it must be carried on into the adolescent years when self-consciousness and sensitiveness about personal appearance are at their height.

DEVELOPMENT OF THE SKELETON

An index of anatomical growth which is less easily observed than those just discussed is the rate of maturation of the skeleton. Obviously, children's bones are smaller and of a different shape from those of adults, but the difference in their bone composition is a much more subtle matter. Before birth and during the early years of postnatal life the bones are soft, spongy, and pliable, because they consist mostly of cartilage or gristle. As the child matures, certain

mineral salts, especially calcium phosphate, are deposited in the cartilage, causing it to harden. This process is known as mineralization or ossification. The child, also, has many more bones than does the adult, and the spaces between them are greater. In the process of ossification these bones increase in width and in length and assume characteristic shapes. Many bones which are separated in childhood grow together, and, as a result of this fusion, the mature skeleton has fewer bones. Thus, the infant has 270 bones, the number increasing to 350 at puberty. However, because of fusion, the adult skeleton has only 206 bones.²⁹ This bone development begins in various places throughout the skeleton called ossification centers, of which there are over 800. Many of these centers do not become manifest until after birth, and new ones continue to appear throughout the teens. In the process of ossification the long bones broaden and thicken, and add to their length by expansion at the ends. Small bony masses, or epiphyses, appear in the cartilage adjacent to the ends of these long bones. As ossification progresses the epiphyses fuse and eventually become attached to the main part or shaft of the bone, and when this occurs growth ceases.³⁰

Ossification is observed by means of x-ray pictures called roentgenograms taken at successive age levels. There are six principal centers in the body where such observations may be made, viz., the hand, foot, elbow, knee, shoulder, and hip. Of these the hand is used most widely because it is farther advanced in development, shows the least variability, and is the easiest to assess.³¹ Furthermore, ossification in the hand and wrist is typical of the process going on in the entire skeleton, and it is necessary only to observe the development of one hand in order to estimate an individual's progress in skeletal growth.

Figures 27-30 illustrate the progressive ossification in the hand of a white female from x-ray photographs taken at the ages of 3 months; 6 years, 3 months; 11 years, 3 months; and 16 years, 3 months. Note the appearance of new epiphyses and their increasing expansion and fusion.

It should be stressed that it is the *rate* of ossification in an individual which is of value in appraising his anatomical development,

²⁹ L. Carmichael (ed.), *op. cit.*, p. 281.

³⁰ Breckenridge and Vincent, *op. cit.*, pp. 241-245; T. W. Todd, *Atlas of Skeletal Maturation*, pp. 13-15; 26-28; 30-32

³¹ *Ibid.*, pp. 16, 17, 19-20.



FIGS. 27, 28, 29, 30. Progressive Ossification of the Hand of a White Female at the Age of 3 Months; 6 Years, 3 Months; 11 Years, 3 Months; and at 16 Years, 3 Months. (Reprinted from pp. 135, 163, 183, 203 of T. W. Todd's *Atlas of Skeletal Maturation*, 1937. By permission of C. V. Mosby Company, St. Louis, publishers.)



so that we are interested primarily in his *progress* rather than in his absolute status.³² Although there are wide individual differences in ossification rates, it is possible, nevertheless, to develop tentative age standards which will indicate whether a child is advanced or retarded anatomically for his particular chronological age. However, unless he is 12 months retarded or advanced anatomically, it is not considered significant from a developmental standpoint.³³ Flory³⁴ has developed a qualitative and quantitative scale for evaluating the osseous development of the hand in terms of skeletal months. He feels that this technique is superior to the measurement of carpal areas or the computation of ossification ratios. Furthermore, he claims that with this scale even an inexperienced person with a small amount of practice can recognize quickly and accurately the degree of ossification shown in the roentgenogram of the hand and thus estimate the skeletal age of the individual concerned. It has been suggested, also, that a satisfactory method of evaluating progress in ossification is to express the child's total score in millimeters for each year as a percentage of his adult total. If an individual's ossification score at age 10 is 200 millimeters, and his adult score is 330 millimeters, he will, at 10 years, have achieved 67 percent of his mature ossification. Another child having the same score at age 10, but with an adult rating of 250 millimeters, will have attained 80 percent of his final status.³⁵ Individual differences in rate of ossification are illustrated clearly in Figure 31, which presents a comparison of two cases measured yearly from the ages of 7 to 17.

As is true of many other aspects of growth, there are marked sex differences in skeletal development. Girls are perceptibly advanced over boys at birth, are about one year ahead at school entrance, one and a half years at age nine, and about two years advanced at adolescence.³⁶ Maximum skeletal growth, however, is attained sooner by girls who have reached approximately their adult status by the age of 16, whereas boys continue until 19. Complete maturation of the skeleton, however, does not take place before the third decade.³⁷

³² *Ibid.*, p. 21.

³³ *Ibid.*, p. 22.

³⁴ C. D. Flory, "Osseous Development in the Hand as an Index of Skeletal Development," *Monographs of the Society for Research in Child Development*, 1936, 1.55

³⁵ Dearborn and Rothney, *op. cit.*, p. 258.

³⁶ Flory, *op. cit.*, p. 127.

³⁷ Todd, *op. cit.*, p. 49.

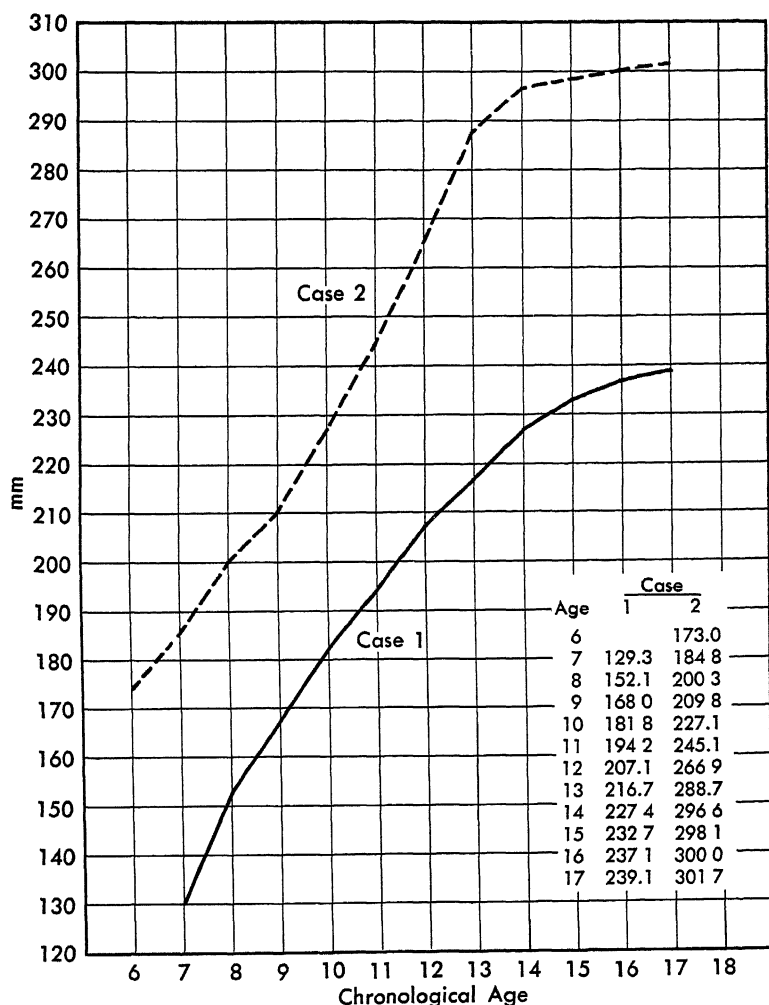


FIG 31 Curve Showing Individual Differences in Rate of Ossification (Reprinted from W F Dearborn and J. W M. Rothney, *Predicting the Child's Development*, 1941. By permission of the Sci-Art Publishers, Cambridge, Mass.)

An interesting feature of skeletal growth is its close relationship to sexual maturation. In general, children who are advanced in ossification reach puberty sooner than do those who show slower skeletal progress. The sesamoid bones located at the base of the

thumb develop in girls between 11 and 12 years and in boys usually between 13 and 14, and serve as a reliable indication of the approach of sexual maturity. In girls, the menarche, or beginning menstruation, will occur within two years after the appearance of the sesamoid bone.³⁸ It is clear that pronounced variations in ossification may have marked effects not only upon the physical status of the individual but upon his educational and social adjustment as well. During infancy, when bones are normally soft and flexible and joints are pliable, the child is able to assume many unusual positions—put his toes into his mouth, for instance—and can also withstand severe falls without serious injury. With advancing age, however, bones should become hard as the result of mineralization, but if this process is retarded, bowed-legs and other skeletal deformities may occur, because the soft bones cannot withstand the strain to which they are often subjected.³⁹

There is a close relationship, too, between ossification and nutrition. Children from superior environments may be a year or more advanced in skeletal development, whereas children from underprivileged homes may be retarded to a similar extent.

Accelerated or delayed anatomical growth may be a significant factor, also, in a child's school adjustment. It was found, for example, that in one city twice as many boys as girls failed in the first year of high school, and there is reason to believe that the two-year anatomical advancement which we have already noted in girls of this age was a contributing factor to this situation.⁴⁰ Differences in anatomical age, closely related as they are to sexual maturity, undoubtedly play an important part in the adjustment of boys and girls to their age mates of both the same and the opposite sex.

CHANGES IN CIRCULATION, METABOLISM, AND DIGESTION

So far in this chapter we have considered those aspects of growth which are classified primarily as anatomical. We shall now turn our attention to developmental changes which are principally physiological in nature. It should be reiterated, however, that no sharp distinction can be drawn between anatomical growth and physio-

³⁸ Flory, *op cit.*, p. 130

³⁹ Breckenridge and Vincent, *op cit.*, p. 240.

⁴⁰ *Ibid*, p. 245.

logical growth. They are closely related and show much overlapping, and are treated separately merely in order to simplify our discussion. Up to the present time many more studies have been made on the anatomical aspects of growth than on the physiological changes accompanying development.⁴¹ Despite the meager literature on this topic, there are certain important phases of physiological growth which are fundamental to an understanding of development during the first 20 years.

Among the most significant changes occurring during childhood and adolescence are those concerned with the heart and the circulatory system. By the time the child is six years old his heart weighs from four to five times as much as it did at birth. At the age of 12 it has increased to about seven times, and by maturity it has grown to 12 times its weight at birth.⁴²

Growth of the heart is slowest between the ages of 4 and 10, and it is smaller in proportion to body size during this period than at any other time while the individual is growing up. The greatest heart lag is at age seven, but some lag may occur in the preadolescent and early adolescent years. This may account partly for some of the functional cardiac disorders occasionally observed at these ages.⁴³ During adolescence, also, the growth of the heart often is unusually rapid, and the increase in its size is much greater proportionately than the increase in the diameter of the blood vessels. For example, the diameter of the aorta, or large artery leading away from the heart, increases by only about 15 percent, while that of the heart approximately doubles.⁴⁴ This means that during childhood a relatively small heart pumps blood into a large opening, while after adolescence a large heart must pump blood into a small opening. Because of these conditions some writers⁴⁵ feel that strenuous physical exercise involving excessive heart strain should be avoided at this time. Other writers, however, believe that this danger has been overemphasized⁴⁶ and that no serious heart damage results from such

⁴¹ Henry, *op. cit.*, chap. 4 by N. W. Shock, especially p. 58.

⁴² Brooks, *op. cit.*, p. 124.

⁴³ Breckenridge and Vincent, *op. cit.*, p. 265.

⁴⁴ L. A. Avenill, *Adolescence* (Houghton Mifflin Company, Boston, 1936), p. 57.

⁴⁵ *Ibid.*; Cole, *op. cit.*, p. 41.

⁴⁶ K. C. Garrison, *The Psychology of Adolescence* (Prentice-Hall, Inc., New York, 3rd ed., 1946), pp. 35-36.

activity. In fact, the curtailment of adolescent participation in sports may have more serious social than physical consequences. Since there are such wide differences in cardiac development among children and adolescents, it is probably safest to guide each individual's activities in accordance with his particular growth pattern.

Changes also take place in the action of the heart, as indicated by variations in pulse rate or heartbeat. It will be seen from the following data⁴⁷ that at birth the pulse rate of girls is higher than that of boys. At age two they are about equal, but at age three the girls' pulse is somewhat slower. They are the same at age nine, but at 13 and thereafter the female pulse exceeds that of the male. These data are based on a quarter-minute taken when the individual was at rest and show, therefore, a somewhat slower than ordinary rate. Notwithstanding these variations, it will be noted that there is a decrease in pulse rate with advancing age. In general, after maturity the female pulse is faster and more regular than is that of the male.

Average Basal Pulse Rate
per ¼ Minute

| | Girls | Boys |
|---------------------|-------|------|
| At birth | 144 | 130 |
| Two years | 103 | 104 |
| Three years | 90 | 95 |
| Nine years | 80 | 80 |
| Thirteen years | 76 | 73 |
| Maturity (20 years) | 69 | 62 |

Interestingly enough, although pulse rate decreases with age, systolic blood pressure increases. The term "systolic" refers to the pressure exerted by the heart during its contraction, while "diastolic" refers to the pressure maintained during its relaxation. Both are measured in millimeters of mercury, but of the two, systolic blood pressure is much more commonly used.⁴⁸

Average systolic blood pressures for both sexes from the first few months after birth until the end of the second decade are as follows:⁴⁹

⁴⁷ Reprinted from *Women and Men* by A. Scheinfeld, p. 56, from data by Drs. W. D. Sutliff and Evelyn Holt and others. By permission of Harcourt, Brace and Company, New York, publishers. Copyright 1943 by Harcourt, Brace and Company.

⁴⁸ For a clear description of the apparatus and techniques used, read P. M. Symonds, *Diagnosing Personality and Conduct* (Appleton-Century-Crofts, Inc., New York, 1931), pp. 407-414.

⁴⁹ Reprinted from R. Burton-Opitz, *A Textbook of Physiology*, p. 370. By permission of W. B. Saunders Company, Philadelphia, 1920.

Average Systolic Blood Pressures for Both Sexes

| | |
|------------------|---------|
| First few months | 70-75 |
| 1-2 years | 80-90 |
| 2-3 years | 90-100 |
| 3-10 years | 95-115 |
| 10-15 years | 100-115 |
| 15-20 years | 105-128 |

There is little difference in blood pressure between the sexes during early childhood, but girls exceed boys between 10 and 13, which is still another evidence of their earlier maturity.⁵⁰ From about 13 on there is a more rapid rise in boys than in girls. By late adolescence blood pressure is considerably lower in girls, and this may contribute to their decreased participation in physical activities.⁵¹ Contrary to popular opinion, blood pressure bears little relationship to height and only a moderate relationship to weight.⁵²

Closely related to the circulatory functions which we have just described are body temperature and metabolic rate. Everyone is familiar with the fact that increased exertion results in increased blood pressure and pulse rate, and that higher pulse rate and blood pressure also tend to bring about a rise in body temperature. Ordinarily this heightened body temperature tends to be compensated for by an increased evaporation of water from the skin in the form of perspiration, so that the normal adult temperature remains fairly stable at about 98.6 degrees Fahrenheit. In children below six years of age, however, there is considerable fluctuation in body temperature. Generally, it is lowest in the early morning and highest in the late afternoon, and there may be a rise as much as one degree after the child has been running around. Parents need not be concerned over these variations, but if the child's temperature rises to 101 degrees, it means illness whether he has been exercising or not. Every part of the body has a different temperature, but usually readings are taken either in the mouth or in the rectum. Rectal temperatures are most frequently used with children below five or six, because they have difficulty in keeping the thermometer under the tongue, or may bite off the tube. It should be remembered, however, that rectal temperatures are about half a degree higher than are those taken in the mouth.⁵³

⁵⁰ Brooks, *op. cit.*, p. 126

⁵¹ Henry, *op. cit.*, p. 61.

⁵² Brooks, *op. cit.*, p. 126.

⁵³ Spock, *op. cit.*, pp. 360-363.

The term "metabolism" is used to describe the physical and chemical changes in the body associated with the production and consumption of energy. The rate at which these processes are carried on when the individual is in a state of rest represents his basal metabolism and indicates the speed at which his food or body fuel is converted into energy, and also how rapidly this energy is utilized. Basal metabolic rate is closely associated with the functioning of the thyroid gland, as we shall see in the next section of this chapter.

In measuring basal metabolism, the amount of air breathed out or exhaled during a period of eight minutes is collected and analyzed. Since the oxygen content of the air breathed in or inhaled by the individual is known, the degree of its reduction in the exhaled air represents the amount of oxygen consumed by the person in maintaining his vital processes.⁵⁴ This is taken as an index of his metabolism and is expressed in calories per square meter of body surface, a calorie representing a standard energy unit.

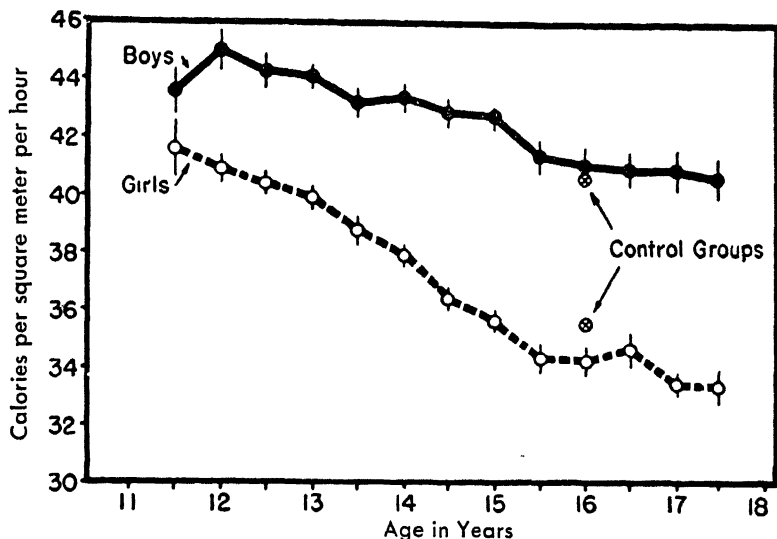
There is a rise in basal metabolism from birth to about two or three years, followed by a consistent decline until the adult level is reached at about 17 in girls and 18 or after in boys.⁵⁵ There is little difference in metabolic rate between the sexes at birth, but after the first year that of the boy is somewhat higher. During the preadolescent and early adolescent years, however, the basal metabolism of boys is substantially greater than is that of girls.⁵⁶ See Figures 32 and 33, which show changes in basal metabolism for both sexes from 11 through 18 years. These findings account in part for the boundless energy and ceaseless activity of younger children as well as for the fact that girls, especially after adolescence, have more sedentary habits than do boys. Attention should be called to the fact, however, that there may be wide individual fluctuations in metabolism which are obscured by the averages given in Figures 32 and 33.

Basal metabolic rate is greatly increased by strenuous exercise, as is shown in an experiment⁵⁷ conducted at the University of California. For example, when boys averaging about 14.5 years were required to climb four flights of stairs (to a height of 58.5 feet) as rapidly as possible, their respiratory volume and oxygen consumption were increased seven to eight times their basal requirements. Their

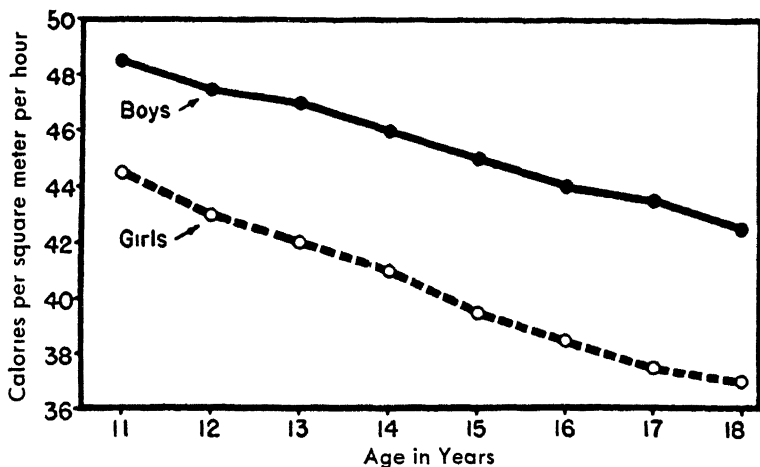
⁵⁴ Henry, *op. cit.*, p. 61

⁵⁵ *Ibid.*

⁵⁶ A. Scheinfeld, *Women and Men*, p. 55.



FIGS 32 and 33. Changes in Basal Metabolism for Boys and Girls 11 to 18 Years of Age (smoothed data). (Reprinted from *Adolescence Forty-Third Yearbook of the National Society for the Study of Education*, Part I, 1944, N. B. Henry, ed., chap. 4 by N. W. Shock, p. 62. By permission of the Society.)



recovery was fairly rapid, however, and in 10 to 15 minutes of rest their rate of oxygen consumption had dropped to within 15 to 20 percent of its basal value. Younger children showed a complete return to basal rates within 30 to 45 minutes, but as they grow older the period required for recovery becomes longer. Blood pressure and

pulse rate also increased markedly during this experiment, but tended to fall quickly during the rest period. The pulse rate, however, although it decreased rapidly during the first few minutes of rest, had not returned to normal at the end of 45 minutes.

Obviously, the process of metabolism is basic to normal growth and maintenance of body tissue, and this, in turn, depends upon the intake, digestion, and assimilation of food. Since metabolism is more rapid in children than in adults, their food requirements are greater in proportion to their size. Food intake for boys is greater, also, than is that for girls because of their higher metabolism and energy output. Naturally, food requirements for both sexes are influenced greatly by the amount of individual activity, but tentative needs in calories for various ages have been estimated roughly by dietitians.⁵⁸ During the first three months the infant requires about 50 calories per pound of weight a day. In the next three months about 45 calories per pound are needed daily, whereas only 40 calories per pound per day are required during the last half of the first year. Thereafter, caloric estimates for various ages to maturity are as follows:⁵⁹

| Age | Daily Calorie Requirements |
|----------------|----------------------------|
| 1½ to 2 years | 900-1200 |
| 3 to 4 years | 1100-1400 |
| 5 to 7 years | 1400-1700 |
| 8 to 10 years | 1700-2000 |
| 14 to 17 years | |
| girls | 2200-2800 |
| boys | 2600-4000 |

The rise in calorie needs is due primarily to increasing body size, since, as we have seen, metabolic rate declines from childhood to adolescence. The relationship between food intake and metabolism is still apparent, however, in the lower calorie requirements for girls 14 to 17.

In addition to variations in energy requirements, food intake is influenced by growth changes in the stomach and digestive tract. As compared with the adult, the child's stomach and intestines are smaller, and their lining is more delicate.⁶⁰ Because of this the types of foods suitable for children are more restricted until puberty, when

⁵⁸ Consult M. S. Rose, *Feeding the Family*

⁵⁹ Adapted from *ibid*, pp. 177, 192, 201, 214, 227, 235.

⁶⁰ Breckenridge and Vincent, *op cit.*, p. 265.

the digestive tract becomes mature. It takes practically one year after birth for the infant to make the transition from a fluid diet to one including solid foods, and to make the adjustment from six feedings per day to the accepted standard of three.⁶¹ Not only is the quantity of food consumed a vital matter during the growing years, but the content of the individual's diet is important as well. Minerals—such as calcium and phosphorus—proteins, carbohydrates, and particularly vitamins are essential to the building of bones, teeth, muscle, nerves, and other body tissues.

Attention has already been called to the relationship between diet and various phases of physical development: height, weight, dentition, and ossification. Dietary deficiencies, also, have been found to have significant psychological consequences. Children who are anemic, or whose energy is low because of faulty diet, often are thought by teachers or parents to be lazy or even mentally retarded. It was shown, for example, that the diet in a private residential school was too high in carbohydrates, and when a better balance was secured there was noticeable improvement in the physical activity and alertness of the children.⁶² Lack of essential dietary elements is sometimes responsible, also, for peculiar food cravings; and many nursery school and primary teachers are familiar with children who insist upon eating dirt, chalk, crayons, finger paint, and library paste.

With the approach of adolescence the stomach increases in length and capacity,⁶³ and for several years there is a tremendous increase in appetite. This is illustrated by the food eaten in an average day by one teen-age boy: two quarts of milk, potatoes, oranges, eggs, apples, pork chops, soup, soda, ice cream, candy, two bottles of pop, crackers, cereal, fruit, jam, peanut butter and butter—a total of 3000 calories.⁶⁴ There is a tendency during this period to overload the stomach, and bizarre food combinations are common. For example, one adolescent girl made a meal of doughnuts covered with peanut butter, milk, green onions, and strawberries. The "Moron's Ecstasy," a "mammoth" sundae developed in California,⁶⁵ further illustrates what curious concoctions appeal to teen-agers. It is a mixture of: a

⁶¹ Rose, *op. cit.*, pp. 167-173.

⁶² From an unpublished report made by F. K. Merry to the director of Perkins Institution, Watertown, Massachusetts, December 6, 1928

⁶³ Breckenridge and Vincent, *op. cit.*, p. 265.

⁶⁴ From "Teen-Age Boys," *Life*, June 11, 1945, 18:91-97.

⁶⁵ From "Mammoth Sundae," *Life*, May 19, 1947, 22 85-88.

quart of ice cream, including eight different flavors; eight fruit and nut toppings of bananas, melba peaches, raspberries, mixed nuts, maraschino cherries, tutti-frutti, pineapple, and whipped cream.

These peculiar eating habits undoubtedly contribute to the appearance of acne and other skin blemishes which are so common during the adolescent years. Such skin conditions are of great emotional and social significance for both boys and girls at these ages and are more disturbing than any of the other physical accompaniments of sexual maturity.⁶⁶

Clearly, children and adolescents need guidance in the establishment of good food habits, and if this is begun early, many of the prevalent minor food likes and dislikes can be prevented. A well-known dietitian claims that good eating habits should be established by the end of the sixteenth year, and that the digestive system should be able to handle practically all types of wholesome food eaten at suitable times.⁶⁷

THE ENDOCRINE GLANDS AND GROWTH

Among the most potent factors influencing development, both directly and indirectly, are the endocrine or ductless glands. According to a well-known endocrinologist, "The evidence is now conclusive that what we are—physically, mentally, sexually, and emotionally—depends in no small measure upon the functions of our endocrine glands."⁶⁸

These glands, located in various parts of the body (see Fig. 34), pour their secretions, called hormones, directly into the blood stream. Their general function seems to be the maintenance of delicate chemical balances within the body. Each gland does not function independently, but the entire endocrine system forms an "interlocking directorate" which acts as a whole. Any significant increase or decrease in the secretion of one gland or set of glands upsets the normal balance between them and results in profound bodily changes. The hormones from some glands apparently may either reinforce or inhibit the activity of others, depending upon a number of varying conditions. The secretion from the anterior pituitary, for example, may stimulate the thyroid, adrenal cortex, and the sex glands,

⁶⁶ Henry, *op. cit.*, p. 95

⁶⁷ Rose, *op. cit.*, p. 241.

⁶⁸ R. G. Hoskins, *Endocrinology*, p. 16.

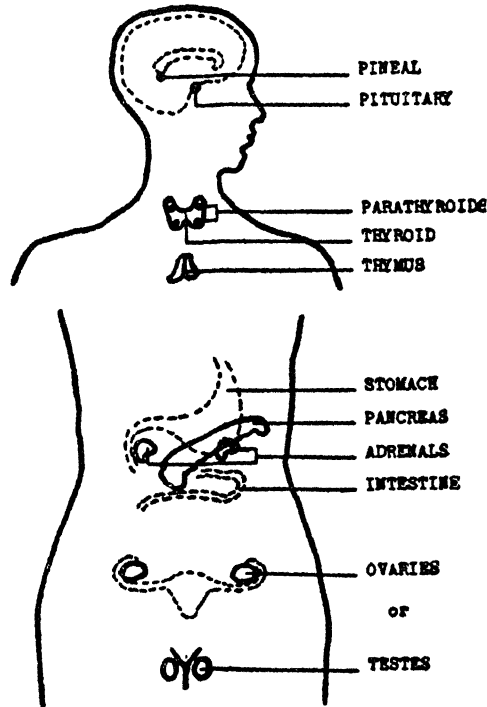


FIG. 34 Schematic Drawing of the Human Body Showing the Locations of the Endocrine Glands (Reprinted from *Endocrinology* by R. G. Hoskins, by permission of W. W. Norton and Company, Inc. Copyright 1941 by the publishers)

whereas the pineal may check the activity of the gonads during childhood. The functioning of the endocrines is complicated further by the fact that some glands have only one secretion while others have two or more, and the pituitary body may produce as many as eight different hormones.⁶⁹

Notwithstanding the close interdependence and complexity of the endocrine system, we have come to associate specific physiological conditions with variations in the activity of particular glands. These physiological changes may have a profound effect upon growth and may also exert a marked influence upon behavior. However, we must

⁶⁹ An excellent table showing the chief endocrine glands, their secretions, and functions is given in an article by Dr. A. S. Parkes entitled "Hormones." See *Journal of the Royal Society of Arts* (London, England), August 30, 1946, 94:597.

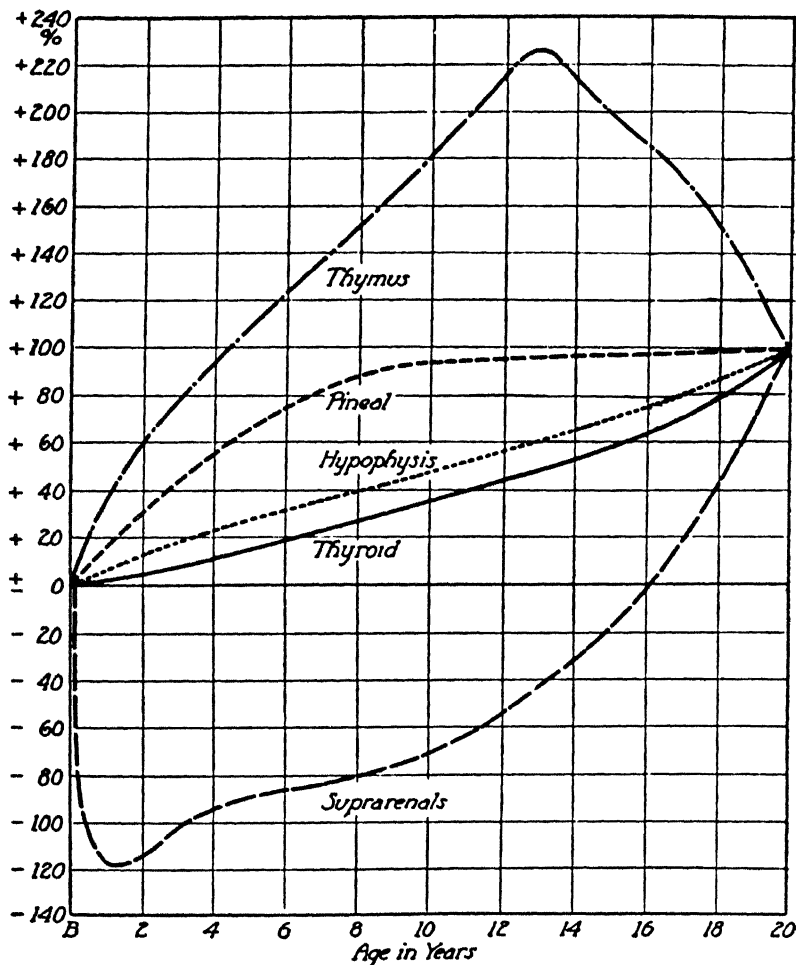


FIG. 35. Graph Showing Postnatal Growth Curves for the Principal Endocrine Glands (Reprinted from J. A. Harris, C. M. Jackson, D. G. Paterson, and R. E. Scammon, *The Measurement of Man*, 1930, chap. 4 by Scammon, p. 200 By permission of the University of Minnesota Press, publishers, Minneapolis.)

guard against ascribing all peculiarities in growth and behavior to glandular causes. Obesity, or extreme fatness, and sluggishness, for example, may result either from thyroid or pituitary malfunction or from nutritional factors not directly concerned with endocrine activity.

As noted on page 58, some of the endocrine glands develop early in the prenatal period and are functioning before birth. It is believed, also, that hormones from the mother's body pass through the placenta and have a definite influence upon the growth of the unborn child.⁷⁰ There is an enlargement of the pituitary gland in women during pregnancy, which suggests that increased hormone production from this organ is essential to the development of the fetus.

An interesting feature of glandular growth is that each structure has its own distinctive maturational pattern, and these patterns are quite dissimilar. This can be seen readily in Figure 35, which presents the growth curves for the thymus, pineal, hypophysis (pituitary), thyroid, and suprarenals (adrenals).⁷¹ Obviously, therefore, certain glands affect growth more at some levels of development than do others. While a detailed discussion of endocrine factors in development is beyond the scope of this chapter, we shall describe some of the principal ductless glands and shall indicate briefly their relationship to growth and behavior. The role of the glands in connection with intelligence, emotion, and personality will be considered further in subsequent chapters.

The thyroid gland, located in the neck astride the windpipe, is perhaps the best known of the endocrines. Its growth is fairly constant from birth to maturity, showing no spurt either in infancy or, strangely enough, during the prepubescent years.⁷² Its size and weight are affected greatly by the iodine content in food and drinking water. In areas where there is an abundance of iodine, the thyroid tends to be smaller, and it enlarges proportionately as the iodine supply decreases. Its hormone, thyroxin, appears to govern the rate of basal metabolism, which, as we have indicated, is the speed at which the individual's life processes operate. Hyperthyroidism, or overfunctioning of the thyroid, produces increased physical activity and nervous tension. The individual is constantly "on the go," finds it difficult to relax and rest, and seems nervous and high-strung. Because of this speeding up of physiological processes, the child with an overactive thyroid may become pubescent earlier than the usual age. Hyperthyroidism seems to be more common among girls and is sometimes associated with menstrual difficulties during adolescence.

⁷⁰ Hoskins, *op. cit.*, pp. 369-370.

⁷¹ Harris, Jackson, Paterson, and Scammon, *op. cit.*, p. 200.

⁷² *Ibid.*, pp. 197-198.

Conversely, hypothyroidism, or underfunctioning of the thyroid, results in a general slowing down of metabolism with a corresponding sluggishness in the individual's reactions. There is a tendency toward obesity, and puberty may be delayed. If hypothyroidism is sufficiently pronounced, the child's general development may be so seriously retarded that he will seem feeble-minded. This condition, known as cretinism, may be improved by the administration of thyroid extract, although complete restoration to normality may not be effected.

The parathyroids, which lie near or sometimes are embedded in the thyroid, seem, under normal conditions, to have the effect of reducing nervous tension. If they are damaged or removed, there is frequently a general heightening of nervous excitation and muscular rigidity to a point amounting to tetany, and death may ensue.⁷³ Parathyroids also seem to have some control over the body's ability to absorb and utilize calcium. Their normal function, therefore, may be an essential factor in ossification, but their exact relationship to this process is still obscure.

The pituitary body, or hypophysis, is suspended from the underside of the brain, practically in the center of the head. The course of its development during the first two decades is similar to that of the thyroid, but the relative amount of its growth is somewhat less.⁷⁴ Although the adult pituitary is only about the size of a pea, it is one of the most complex glandular structures in the body. It consists of two lobes, anterior and posterior, each of which produces several different hormones which are quite diverse in their functions. A detailed discussion of the pituitary body cannot be entered into here, but two of the secretions from its anterior lobe are of particular interest to us. One of these, the so-called growth hormone, seems to regulate skeletal development, and most cases of gigantism or dwarfism result from the over or underfunctioning of the anterior pituitary.

One of the best-known cases of pituitary gigantism was that of an Illinois youth who, at his death in July, 1940, at the age of 22, was 8 feet, 9½ inches tall, weighed 491 pounds, and was still growing. Had he lived, it was predicted that he would have attained a height of nine feet before his growth ceased. He had a normal birth weight

⁷³ Hoskins, *The Tides of Life* (W. W. Norton and Company, Inc., New York, 1933), pp. 108-113.

⁷⁴ Harris, Jackson, Paterson, and Scammon, *op. cit.*, p. 199.

of 8½ pounds, but by the age of six months he weighed 30 pounds. His growth did not attract attention, however, until at 18 months he tipped the scales at 62 pounds. It is interesting to note that such giants do not have muscular strength in proportion to their size, and have a weakened sex drive. They also have low resistance to infection, as is illustrated by the fact that the death of the above mentioned youth was caused by a foot infection resulting from the chafing of a steel brace, which he was forced to wear to support his weak ankles.

The dwarfs or midgets whom one sees in carnivals and side shows are almost always the result of pituitary deficiency. The once famous Buster Brown shoe character, Johnny Clifton, is a midget 52 inches tall and is married to another midget 47 inches tall.⁷⁵ The foregoing illustrations are, of course, extremes, but any marked variations in size, obviously, may affect an individual's personality and social adjustment.

The other hormone from the pituitary which we shall consider apparently has the effect of activating the gonads or sex glands. An oversupply of this hormone during childhood may result in unusually precocious sex development, complete sexual maturity sometimes arriving at eight or nine years of age, or even earlier. A startling instance of unusually early sexual maturation occurred in 1939 when a five-year-old Peruvian Indian girl gave birth to a 5.96-pound son. At the time of the baby's birth the mother was three feet, one inch tall and still had her "baby" teeth!⁷⁶ If this pituitary hormone is deficient, however, sexual maturation may be greatly delayed or may not occur at all.

The exact functions of hormones from the posterior lobe of the pituitary body are as yet not understood clearly. They probably have some relationship to the individual's ability to burn fat and to store water in the tissues. They may, also, assist in maintaining tonus in the smooth muscles, especially those lining the digestive tract. Because of these factors, the posterior pituitary may have an important influence upon weight and nutrition.

The adrenal or suprarenal glands are situated over each kidney and are identical in structure and function. Each consists of a central

⁷⁵ From an article in the *Charleston Daily Mail*, date unknown.

⁷⁶ From an article in the *Charleston Daily Mail*, September 27, 1941. See also, M V R Thayer, "Peru's Five-Year-Old Mother," *Coronet*, March, 1941, 9.118-123.

core, the medulla, and an outer sheath, the cortex, which secrete separate hormones. These glands grow rapidly during the prenatal period, following the typical course of fetal development. Within the first two postnatal weeks, however, they lose about one-half their birth weight, owing primarily to the deterioration of the cortex. Regeneration begins in middle childhood, but the birth weight of the adrenals is not regained until puberty. Thereafter, it increases steadily until adult status is attained.⁷⁷

The secretion from the medulla is called adrenin, and if its concentration in the blood is increased, it causes a rise in blood pressure, more rapid heartbeat, and the release of large amounts of sugar from the liver. These physiological changes, which reinforce the strength of the body, are present in strong emotion, which apparently stimulates adrenal action. Unusual feats of strength often are performed under emotional stress, as the following item shows:

WEAKER SEX

Vincennes, Ind., April 19— Five perspiring and embarrassed men struggled to carry a piano into Mrs. Evaline McGiffin's farm home. Two excited neighbor women had run out of the house with it when a nearby barn caught fire.⁷⁸

Some physiologists, however, think that increased muscular strength during emotion results from the action of cortin rather than of adrenin. We shall consider the role of the adrenals in emotion in greater detail in Chapter 9.

The hormone from the cortex, known as cortin, is strongly positive for sexual maturation and seems to be associated with general sex interest and the characteristics and traits commonly ascribed to each particular sex. Its degeneration during infancy and early childhood is significant when we realize that sexual development is dormant during this period. Cortin seems especially to reinforce the effect of the male sex hormone, which women have in addition to their female sex hormone. Consequently, overactivity or disease of the adrenal cortex in women often causes them to develop certain male characteristics, such as a deep voice or the luxuriant facial hair exhibited by "bearded ladies" in circuses, carnivals, and side shows.

The gonads, or sex glands, in addition to secreting reproductive

⁷⁷ Harris, Jackson, Paterson, and Scammon, *op. cit.*, pp. 195-196.

⁷⁸ From the *Charleston Daily Mail*, date unknown.

cells (sperms and ova) after puberty also produce hormones which are necessary to normal sexual development. These glands, called testicles in the male and ovaries in the female, develop within the abdominal cavity before birth. In the seventh prenatal month the testicles ordinarily descend into the scrotal sacs,⁷⁹ but this process occasionally is delayed until some years after birth. The ovaries, however, are retained within the body throughout life. The post-natal growth of the gonads (not included in Figure 35) shows a slight rise in infancy, followed by a latent period beginning at the end of the first year and extending to the latter part of the tenth year. A sharp spurt occurs before puberty and continues into adolescence and early maturity.⁸⁰

We have already noted that one of the hormones from the anterior pituitary activates the gonads. It is primarily the effect of this hormone which makes the sex glands produce sperms and ova, and it also causes them greatly to increase their output of sex hormones. Gonadal hormones, in turn, tend to suppress the action of the pituitary growth hormone, so that normally, as we have seen, the rate of physical growth decreases after the coming of sexual maturity. Children who become pubescent early, therefore, cease growing sooner, while the late maturers continue their growth over a longer period.⁸¹ This is a striking illustration of the endocrine interaction, which was mentioned earlier.

Recent research has shown that every individual is bisexual,⁸² producing both male sex hormones or androgens, and female sex hormones or estrogens. Both these secretions are found in the urine of boys and girls as early as five years of age. With the advent of puberty, however, each sex produces a much higher proportion of its appropriate hormone. On the average, the mature man secretes from two to two and a half times as much of the male hormone as does a woman, and normally never produces less. Although the total output of the female hormone in women is eight to ten times that of man, it is much more irregular, and at times the male may produce more of it than she does.⁸³

⁷⁹ M. S. Gilbert, *Biography of the Unborn* (The Williams and Wilkins Company, Baltimore, 1938), p. 86

⁸⁰ Harris, Jackson, Paterson, and Scammon, *op. cit.*, pp. 192-193.

⁸¹ Henry, *op. cit.*, pp. 16-17

⁸² *Ibid.*, p. 3, Hoskins, *Endocrinology*, p. 213

⁸³ Scheinfeld, *op. cit.*, pp. 153-154

Endocrine glands other than the gonads undoubtedly influence the production of sex hormones. It is said that the greater instability of the female in estrogen output makes her more susceptible to the effects of abnormal glandular conditions. An example of this was mentioned above in the case of "bearded ladies" resulting from abnormalities of the adrenal cortex.

As would be expected, the effect of increased amounts of sex hormones at and after puberty, in addition to inhibiting growth, is to promote sexual development. There is a rapid increase in the size of the primary sex organs, viz., the penis and scrotum in the male, and the vagina, Fallopian tubes, and uterus in the female. The so-called secondary characteristics appropriate to each sex also develop at this time. In boys these include change of voice, growth of the beard, and the appearance of wedge-shaped indentations in the hairline on either side of the forehead. Beginning menstruation, which at first may be irregular, and breast development are conspicuous secondary characteristics which occur in girls, while in both sexes hair appears in the armpits and in the pubic areas. The bodily and facial contours typical of each sex at adolescence, which were described in a previous section, also may be classified as secondary sex characteristics and are controlled in large measure by the action of sex hormones.

The gonads, therefore, are essential factors in normal sexual development, and disease in or removal of them results in sexual infantilism and a lessening of normal sex interest. In such cases, a noticeable reduction in male aggressiveness occurs even in childhood. In both sexes puberty fails to appear, and the secondary sex characteristics mentioned above do not develop.

Two other organs to which endocrine functions have been ascribed are the thymus and pineal glands. "The thymus is located above the heart in the region where the chest cavity narrows to disappear in the root of the neck."⁸⁴ It consists largely of lymphoid tissue, and its growth follows that of a typical lymphoid structure. Its size increases rapidly during childhood, reaching a peak at 13 years.⁸⁵ Thereafter, it decreases, but it does not atrophy completely in adulthood, as was once believed.⁸⁶ Recent investigations have raised considerable doubt

⁸⁴ Hoskins, *Endocrinology*, p 261.

⁸⁵ Harris, Jackson, Paterson, and Scammon, *op. cit.*, p. 200.

⁸⁶ Hoskins, *Endocrinology*, p 262

as to whether or not the thymus should be classified as an endocrine gland.⁸⁷ It is not indispensable to life, but it may have an important relationship to blood formation, nutrition, and growth. Enlargement of the thymus during infancy and early childhood may be a hazard, since it tends to cause difficult breathing and spasms, sometimes resulting in sudden death.⁸⁸

The pineal gland is a cone-shaped organ attached to the brain, opposite the pituitary body.⁸⁹ The course of its development is somewhat similar to that of the nervous system, rising steadily until puberty and then leveling off.⁹⁰ From childhood on it tends to become loaded with calcium salts, referred to as "brain sand," but, contrary to previous beliefs, it persists as an independent structure throughout life.⁹¹ The exact functions of the pineal still are obscure, in fact, it cannot be said definitely that it is an endocrine gland. Experimental findings as to its effects are largely contradictory, since either its removal or the administration of its substance may accelerate growth in animals. At present, the evidence suggests that the pineal gland secretes a hormone which assists in regulating bodily growth.⁹² It also may have a restraining effect upon other hormones which are known to be strongly positive for sexual maturity, holding them in check during childhood and thus preventing abnormally early puberty.

Other organs of the body, such as the liver, stomach, and intestines, also may have endocrine functions. Certain cells in the pancreas, called the islands of Langerhans, secrete insulin, a hormone, which is essential to the maintenance of a normal concentration of sugar in the blood. Absence of this hormone produces the condition known as diabetes, wherein the individual is unable to retain blood sugar. Unless this disease is checked by the artificial administration of insulin, death may ensue, and even under treatment the diabetic suffers from lowered energy and lacks resistance to infection.

Some attempts have been made, especially by popular writers, to classify individuals into various physical and personality types according to glandular dominance. The endocrine system, however, is

⁸⁷ *Ibid.*, p. 18

⁸⁸ *Ibid.*, pp. 268-270.

⁸⁹ *Ibid.*, p. 254.

⁹⁰ Harris, Jackson, Paterson, and Scammon, *op. cit.*, pp. 200-201.

⁹¹ Hoskins, *Endocrinology*, p. 255.

⁹² *Ibid.*, p. 260.

so complex, and the possible variability of glandular combination is so great,⁹³ that any such fixed types are wholly artificial and without scientific justification. The endocrine glands are powerful factors in growth, however, and some knowledge of them is fundamental to an understanding of development and behavior

THE PSYCHOLOGICAL SIGNIFICANCE OF GROWTH

Throughout this chapter we have stressed the close relationship between physical growth and the individual's social and emotional adjustment. We have pointed out that marked deviations from what is considered to be the normal growth pattern may have profound psychological effects and may be a major cause of behavior problems.

Aberrations in growth may occur, of course, at any level of development. They are somewhat less likely to be a problem in early and middle childhood, because, as we have seen, growth is more uniform at this time than at any other period during the first two decades. The arrival of sexual maturity, however, introduces wide variations in both rate and pattern of growth, and this event is perhaps the most significant psychologically of any which occurs during the growing years.⁹⁴

The terms "puberty" and "adolescence" have been used in referring to sexual maturation, and they are sometimes employed synonymously. "Puberty," however, usually refers to the specific age at which sexual maturity occurs, whereas "adolescence" describes the period of several years between puberty and adulthood. Thus, if a girl of 12 begins to menstruate, she has attained puberty, but she will be adolescent for several years thereafter. The onset of the menarche generally is taken as an index of the arrival of puberty in girls, although it has been shown that ovulation, or the production of egg cells, may not occur for some time after its appearance.⁹⁵ In boys there is no such specific indication of puberty, and the exact time of its advent is difficult to determine. The appearance of live sperm cells in the urine shows conclusively that the boy's procreative functions are mature.⁹⁶ Analyses of this kind are cumbersome, however, and unless they are made frequently during the time prior to

⁹³ *Ibid.*, p. 343.

⁹⁴ L. Carmichael (ed.), *op. cit.*, chap. 12 by W. Dennis, especially pp. 637-645.

⁹⁵ Henry, *op. cit.*, p. 3.

⁹⁶ *Ibid.*

puberty, the exact age of its onset cannot be determined. Years ago Crampton⁹⁷ suggested another criterion for determining puberty in boys. According to this, pubescence begins with the appearance and rapid growth of fine, unpigmented hair in the genital area. The second stage is characterized by pigmentation, and puberty ends with the appearance of the kink or twist of this hair.

With the increasing emphasis upon adequate and truthful sex instruction during recent years, fewer children approach puberty without some knowledge of its nature and significance. Nevertheless, too many boys and girls still are permitted to reach sexual maturity without a clear understanding of its meaning, and such ignorance merely aggravates what, under the best conditions, is an extremely difficult adjustment problem. Girls should understand clearly the function of menstruation in relation to fertility. They should not be allowed to regard themselves as "sick" or "indisposed" but should be encouraged to pursue their normal routine of activities in so far as it is possible. Extreme attitudes of shame and inferiority toward this normal physiological event also are undesirable. The boy should realize that such occurrences as nocturnal emissions, the involuntary ejaculation of semen during sleep, are in no way abnormal. The rapid development of the genitals and the appearance of pubic hair add to the sex-consciousness of boys and girls during pubescence and adolescence and make constructive guidance in the development of wholesome attitudes essential at this time.

The secondary aspects of sexual maturity may also have important psychological implications. The boy's voice normally breaks an entire octave, and it may be two years or more before he gains complete control over it. When he tries to talk during this period, he may alternate between a basso profundo and a soprano squeak, much to his discomfiture and frequently to the amusement of his friends. Some boys become so self-conscious over this lack of voice control that they refuse to talk, or will say very little. An instance is shown by the case of a junior high school boy whom no amount of punishment or threats of failure could induce to recite or take part in any oral work, although he willingly co-operated in activities where he was not required to speak.

Girls often are greatly concerned over unusually rapid or un-

⁹⁷ C. W. Crampton, "Physiological Age a Fundamental Principle," *Child Development*, 1944, 15.1-52. See p. 10 especially. This material was first published in the *American Physical Education Review* 1908 13

usually slow breast development. They probably are more sensitive than boys, too, about body contours and proportions which may make them seem either extremely short and dumpy or noticeably large and awkward. Examples of this are seen in the case of the 17-year-old girl five feet, eight inches tall who spends much of her time weeping over her height, and the college girl of 20, six feet tall and correspondingly large in body proportions, who feels like a giant and is avoided by all the boys at parties and dances.

Adolescent boys, too, may be quite conscious of their marked differences in height and weight. Such nicknames as "Shorty," "Tubby," "Slim," "Skinny," and "Shrimp," although often accepted with outward good nature, do, nevertheless, bear a note of derision of which the recipient is fully aware.⁹⁸ There are numerous cases on record wherein the sense of inferiority over such physical characteristics has been so acute that it has led to an attempt at compensation through bizarre and even delinquent behavior. In a study of a representative group of adolescents over an eight-year period⁹⁹ it was found that 31 percent of the boys and 41 percent of the girls had experienced some emotional disturbance over various physical manifestations. The investigators felt this to be a conservative estimate, since there were doubtless many others whose problems did not come to their attention.

Another factor which is perhaps recognized even less is the increased awareness among adolescents of body odors,¹⁰⁰ resulting in a greater emphasis upon personal cleanliness as a factor in social acceptance. The girl who has not developed good hygienic habits will not be popular, even though she may seek to cover up menstrual or perspiration odors with the lavish use of strong toilet water or deodorants. Neither will perfumed lipsticks nor "Sen-Sens" successfully camouflage "halitosis" originating in decayed or unclean teeth, diseased tonsils, or constipation. Similarly, the boy who does not bathe sufficiently or change his socks often enough is not likely to be sought after.

Still another problem which is most disturbing to both sexes is the appearance of acne or other skin blemishes, particularly on the face. Such skin conditions are very prevalent and often cause acute feel-

⁹⁸ Cole, *op. cit.*, p. 24.

⁹⁹ Henry, *op. cit.*, pp. 85-86.

¹⁰⁰ *Ibid.*, pp. 95-97.

ings of inferiority, resulting in a tendency to withdraw from group activities. Acne is due primarily to the overactivity of the sebaceous glands,¹⁰¹ and it may be aggravated by dietary and digestive conditions. Its correction does not lie in the profuse application of face creams and lotions, but rather in frequent washing with soap and water and the establishment of regular habits of eating and elimination. The adolescent should be helped to realize, also, that other people are not as aware of his blemishes as he believes them to be.

The psychological consequences of early or late maturity have been mentioned earlier, but the point is of sufficient importance to merit further consideration. The following cases will serve to make clear the kinds of adjustment problems faced by individuals in whom puberty is either accelerated or delayed.

H. experienced her first menstruation at nine and a half years and continued to have regular periods thereafter. She was as mature in appearance and in interests as most 13-year-olds and was usually taken to be about that age by persons who did not know her. She was somewhat advanced intellectually, but not enough to place her with classmates of a similar level of physiological development. She regarded the other children in her grade as babies, and her schoolwork as childish. She refused to participate in any of the social activities of her class, but sought admission to groups of girls several years her senior. These older girls, knowing H.'s true age, tolerated but did not fully accept her. She belonged nowhere, therefore, and her social adjustment was extremely difficult.

In contrast to H, B is an 18-year-old college freshman who has not yet reached the menarche. She is small and immature-looking, and other girls of her age treat her like a child. Needless to say, she is completely uninteresting to college boys, who pay absolutely no attention to her. Her delayed development is a source of great anxiety and unhappiness to B., and although her family physician assures her that she will mature eventually, this does not make her present situation any easier.

A. is a high school boy of 16 who is not yet sexually mature. He is small in comparison with other boys of his age, and somewhat effeminate in appearance. He sings soprano in the church choir, and there are as yet no signs that his voice is breaking. A. had a hard time in junior high school, being constantly picked on by other boys. The fact that he wore glasses and had bands on his teeth undoubtedly added to his difficulties. He does good academic work, is interested in several constructive hobbies,

¹⁰¹ *Ibid.*, p. 26.

and now has a number of friends. His delayed maturity, however, makes it difficult for him to be wholly accepted by the more advanced boys and girls with whom he must associate.

It should be reemphasized that if parents and teachers wish to understand children and adolescents they must have some knowledge of the nature of their physical development and its relationship to behavior. Physical conditions are not the only causes of adjustment difficulties, of course, but they undoubtedly are a contributing factor.

SUMMARY

In general, growth is greatest during the prenatal period and is still relatively rapid during infancy and early childhood. It is slow but constant in middle childhood, shows a spurt prior to puberty, and then tapers off during adolescence. It is a complex process, different body structures having their own growth rates. Anatomical growth refers to the development of body structure, whereas physiological growth is concerned with function.

Height-weight tables are misleading, because they obscure individual differences and are sometimes inconsistent owing to errors made in taking measurements. Many factors influence height and weight, such as ethnic and family background, nutrition, amount of sleep and exercise, and the socioeconomic status of the family. In the final analysis, the child's growth should be judged by his own biological norm. Generally, boys are taller and heavier than girls except in the years preceding puberty; however, girls reach their adult proportions sooner than do boys. During the first two decades height increases nearly $3\frac{1}{2}$ fold, while body weight increases about 20 fold.

The head and the parts of the body nearest it reach their maximum growth sooner than do the parts more distant from it. Although the upper part of the face attains its maximum growth between birth and six years, the lower part continues to change until maturity. Uneven facial growth during adolescence may produce peculiarities in appearance. Striking changes occur, also, in general body contour, but sex differences do not become apparent until adolescence.

Dentition differs from other types of growth in that two sets of teeth are developed by every individual. As an index of growth, the

sequence in which teeth appear is more important than the exact age at which they erupt. Dentition is affected by dietary and other environmental conditions, but by the age of 12 or 13 the child has acquired practically all of his permanent teeth with the exception of the wisdom teeth.

A more subtle index of development is the process of ossification, wherein the bones become calcified. There are different centers in the body where ossification can be observed by x-ray, but probably the hand and wrist are the least variable and easiest to assess. In appraising anatomical development, *progress* is more important than absolute status. Girls are more advanced in ossification than are boys, and at high school entrance are accelerated about two years. Anatomical age can be used as a satisfactory basis for predicting sexual maturity.

No sharp distinction can be drawn between anatomical and physiological growth. In general, pulse rate declines and blood pressure rises with increasing age. Body temperature is quite variable in children up to about six years of age. Metabolic rate is higher in children and falls as age advances. Metabolism is lower in girls than in boys during the preadolescent and early adolescent years. Increased calorie requirements from infancy to adulthood are due primarily to greater body size. Adequate diet is essential to normal growth, and good food habits should be encouraged.

The endocrine glands function as an interlocking system, and their hormones are of both direct and indirect importance in growth and behavior. The various glands have different growth rates which may be quite dissimilar. The secretion from the thyroid regulates basal metabolism, while hormones from the pituitary body control skeletal development and stimulate the gonads. Adrenin reinforces the body during emotional stress and cortin evidently is associated with the action of the sex hormones. Every individual produces both male and female hormones, and it is the preponderance of these which causes the development of secondary characteristics appropriate to each sex. The endocrine functions ascribed to the thymus and pineal still are obscure, but the secretion from the latter may check the effects of other glands which are positive for sex development.

Wide variations in growth have significant psychological consequence upon both boys and girls, especially during puberty and adolescence. Of particular importance are: attitudes toward begin-

ning menstruation and the occurrence of nocturnal emissions, voice changes in boys, breast development and body contours in girls, marked difference in size, and the appearance of skin blemishes. Delayed or accelerated puberty may also be responsible for difficulties in social and emotional adjustment.

Having considered the various aspects of anatomical and physiological growth and their psychological implications, we shall turn our attention in the next chapter to the development of motor abilities and their significance in the lives of children and young people.

SUGGESTED ACTIVITIES

1. Measure the height and weight of: (a) a preschool child, (b) a child between 7 and 10 years, (c) a child around 12 to 14, and (d) an adolescent of 17 or 18 years.
2. Compare your findings with some good standard height-weight tables, and try to explain any observed discrepancies. Why should the individuals whom you measure be of the same sex?
3. Check on the tooth eruption of an infant or child of your acquaintance. How does the time and sequence compare with the standards given in your text?
4. Report to the class any instances of unusual tooth eruption, either from your experience or from newspaper clippings.
5. If your college or university is equipped to give metabolism tests, secure permission from the proper authorities to observe the technique used.
6. Ask an adolescent boy or girl of your acquaintance (withhold name) to list the types and amounts of food eaten during a typical day. With the aid of Mrs. Rose's *Feeding the Family*, figure the approximate number of calories consumed.
7. Report to the class (withholding names) any cases of unusual growth traceable to glandular imbalance, which you have observed or read about.
8. Write a brief, anonymous account of some phase of physical growth which disturbed you during childhood and adolescence. Appoint some member of your class to collect and summarize this material.

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C H A P T E R 5

HOW MOTOR ABILITIES DEVELOP

When we speak of motor abilities we usually refer to various types of bodily movement resulting from the coordinated activity of nerves and muscles. For convenience, these often are divided into two main classifications:¹ first, gross movements, involving all or a large part of the body, such as prenatal and postnatal mass activity, walking, running, jumping, swimming, skating, and bicycling, second, fine coordinations involving smaller muscle groups, like grasping, throwing, hitting, pinching, sewing, using tools, writing, drawing, and painting. In everyday experience, such a classification is largely arbitrary, because many motor performances include both gross and finer movements or some gradation between them. It is useful, however, in describing activities which are predominantly more of one type than of the other.

In this chapter we shall outline the development both of gross and of fine motor abilities, and shall see how the individual progressively achieves control of his body from infancy to maturity.

HOW ARE MATURATION AND TRAINING RELATED TO MOTOR DEVELOPMENT?

Motor development is not a random sort of growth; rather it unfolds in an orderly sequence. In Chapter 3 we saw that movements begin long before birth and are basic to the later development of

¹ N. B. Henry (ed), *Adolescence*, chap. 6 by H. E. Jones.

posture, locomotion, and prehension. This prenatal activity, which is predominantly mass and nonspecific, continues throughout the neonatal period and into early infancy. From this generalized activity all kinds of motor abilities eventually develop. As will be seen later, each child follows similar patterns of motor growth, but the rate at which they develop varies with the individual. Experimental studies show that both the rate and the pattern depend more upon maturation, or inner growth, than upon training and experience.

The importance of maturation in gross motor abilities has been confirmed by experiments conducted at Yale University by Dr. Arnold Gesell and his collaborators. They studied a pair of identical twin girls at intervals between the ages of 46 weeks and 14 years. The technique used is called the "method of co-twin control," whereby one twin is trained in a certain activity, while the other is used to check the effects of such practice. Since these twins presumably have identical inheritance, any noticeable change in the behavior of the trained twin as compared with that of the untrained one would be evidence of the effect of the special instruction given. Conversely, if the behavior of both twins is closely similar, after one has been subjected to intensive practice in some activity, then it may be assumed that their development is primarily the result of maturation.

One twin, referred to as "T," was given training in stair climbing at the age of 46 weeks. She received practice for 10 minutes daily, six days a week over a period of six weeks. During this time, the other twin, known as "C," was given no training. At the age of 52 weeks (after six weeks of training), twin T could climb the staircase in 25.8 seconds. Her instruction was then discontinued, and a week later similar practice was started with C. On the first day of her training, C climbed the stairs in 45 seconds. She also mounted the steps seven times, which T had not done until after three weeks of training and did not surpass until she had practiced for five and a half weeks. It should be noted that C was seven weeks older than T when her training was begun, and this added maturity apparently offset T's slightly better initial postural control in addition to the three weeks of practice. At 55 weeks, after only two weeks' training, C climbed the steps in 10.3 seconds, which was about half the time required by T at 52 weeks after six weeks of practice. By 56 weeks the stair-climbing performance of both twins was strikingly similar.

This experiment indicates that motor abilities like stair climbing are due primarily to maturation. They are not influenced greatly by practice, and the small advantage gained in this way appears to be only temporary. The superiority of the untrained twin at 55 weeks, according to Gesell, is due more to greater maturity than to the effects of the short period of practice she received. Her pattern of climbing, also, was much more mature than T's had been some weeks earlier. Training, therefore, does not transcend maturation, although it may assist in perfecting a skill for which the maturational background is already present.²

Another extensive experiment on twin boys, Johnny and Jimmy, was carried on by McGraw for a period of three years.³ These twins were thought at first to be identical but later turned out to be fraternal. Johnny was given extensive practice in a number of motor activities, such as crawling and standing, which are common to the race. He also was given training in individual skills, like climbing, skating, and swimming. While this practice was going on, Jimmy was given no special training. Notwithstanding the practice given to Johnny, the twins were much alike in their development of racial or phylogenetic activities. In individual or ontogenetic activities, however, Johnny was far superior. Nevertheless, when given an opportunity to learn these skills, Jimmy's progress was much more rapid than Johnny's had been at an earlier age. This suggests that maturation is a basic factor in phylogenetic activities, and emphasizes again that with greater maturity the rate of acquiring ontogenetic skills is much faster. The fact that these twins are fraternal may influence the findings to some extent, since their hereditary backgrounds are different.

Several other investigations show the greater importance of maturation as a factor in the development of early postnatal behavior. In one of these⁴ a pair of fraternal twins was reared under highly restricted conditions between the ages of one and nine months. Op-

² A. Gesell and H. Thompson, "Twins T and C from Infancy to Adolescence: A Biogenetic Study of Individual Differences by the Method of Co-Twin Control," *Genetic Psychology Monographs*, 1941, 24.3-121; also R. G. Barker, J. S. Kounin, and H. F. Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 13.

³ M. B. McGraw, *Growth: A study of Johnny and Jimmy*.

⁴ W. Dennis, "The Effect of Restricted Practice upon the Reaching, Sitting, and Standing of Two Infants," *Journal of Genetic Psychology*, 1935, 47:17-32.

portunities for reaching, sitting, and standing were prevented until after the time when such activities normally appear. This was done by keeping the child on his back, restricting his arms by tucking in the bedclothes tightly, and preventing social stimulation.

Reaching for a dangling ring usually occurs in the average child by the 200th day, but did not appear in the case of the twins until the 258th day, although the ring was presented to them for the first time at the 245th day. Normally, a baby sits alone before the 245th day, but the twins were denied the opportunity to sit alone until the age of 262 days. One of them did not accomplish sitting alone until the 298th day, and the other until the 326th day. The average infant may stand with help by the 270th day, but the twins could not do this when first given an opportunity at 364 days. By the 367th day, however, both of them were standing with help. Although a restricted environment resulted in some delay in the appearance of reaching, sitting, and standing, these forms of behavior were manifested within a relatively short time once an opportunity was given. Evidently, maturation was proceeding despite the lack of stimulation and exercise.

A study of the cradling practices of the Hopi Indians confirms further the significance of maturation in infants.⁵ As soon as it is born, the Hopi child is bound to a board so firmly that he cannot turn his body or release his hands, although his head is free to move. This cradleboard is placed either upon the floor or upon the bed in a horizontal position and is seldom carried about. For the first three months the infant is freed for only about one hour daily to be bathed and to have its diapers changed. He sleeps on the board night and day and is not released even for nursing. Freedom is increased gradually, and from six months on (in some cases beyond a year), the board is retained primarily for daytime naps and sleeping at night. Despite the limitations of movement imposed by the cradleboard, especially during the early months, the infant, in his brief periods of freedom, exhibits all the activities observed in unrestricted babies, and sitting, creeping, and walking follow in the usual order. Since some of the Hopis have discontinued the use of the cradleboards, it is possible to compare the later behavior of "cradled" and "unca-

⁵ W. Dennis and M. G. Dennis, "The Effect of Cradling Practices upon the Onset of Walking in Hopi Children," *Journal of Genetic Psychology*, 1940, 56:77-86.

dled" children. Data on these two groups show that the average age of walking was 14.98 months for the restricted infants, and 15.05 months for those who were unrestricted, a difference of only 0.07 of a month. According to this investigation the development of walking seems to depend mostly upon maturational factors and is not retarded by limitation of activity during infancy.

From the studies which have just been described, it is clear that maturation plays a major role in motor development. It is futile, therefore, to try to force a child to walk or to perform other complex motor functions until his neuromuscular system is sufficiently mature. Once this maturity has been attained, walking and other motor activities will appear if opportunities and encouragement are provided. Training is important, especially in individualized motor skills, but adequate maturation must be present if the full benefit of such training is to be achieved.⁶

HOW SITTING UP AND WALKING DEVELOP

It has been indicated already that the neonate has an extremely large head as compared with the rest of his body. He has little control of head movements at birth, and when stimulated responds primarily with generalized reactions.

The newborn infant requires much care in handling because the muscles of the head and neck are weak, and the head will wobble if the baby is picked up carelessly. Even though there is improvement in the strengthening of these muscles, most babies need support for the back and head during the first three months. In lifting an infant, mothers usually are urged to stand at the right side of the child with the right hand placed under the baby's buttocks and the left hand under his head and shoulders. By turning the right wrist slightly the mother can rest the child's head against her left shoulder. When sitting down the mother is advised, before removing the child from her shoulder, to lower him to her lap by bending forward until he almost rests on her knees.

By the end of the first month the head and neck muscles have become more mature and the infant is able to hold his head up for a few seconds when lying prone, i.e., on the stomach. These first at-

⁶ W. Dennis, "Infant Development Under Conditions of Restricted Practice and of Minimum Social Stimulation," *Genetic Psychology Monographs*, 1941, 23:143-189.

tempts are for only a few seconds and often are so wobbly that the head may fall forward with some force. Between one and two months, depending upon the baby's growth rate, he turns his head to either side. By two or three months he holds his head and chest up by pushing with his hands and arms. At first he can do this for only a few seconds, but as his nervous system matures he can maintain this position for a longer time. As he turns farther to the side, he begins to use his shoulders and the muscles of the upper part of the trunk. The gradual strengthening of all these muscles enables him to sit up with support for a short time, often as early as four or five months.

The newborn does not have sufficient strength to roll over, and it is necessary for the mother to turn him frequently from side to side during sleep until he is four to six months of age, because lying in the same position is a strain on his muscles. If the baby's development is rapid, however, it is not safe to leave him unguarded on any high place after three or four months, as he may roll off.

By the end of the eighth month, or, in some cases, as early as the sixth month, independent sitting may be established. At first this position can be maintained for only a few seconds, and the baby may fall forward, sidewise, or backward. Parents usually are warned not to allow their infant to sit up until he can hold his back in a straight line. If he is permitted to sit alone too soon, proper development of his muscles is delayed and he may acquire a faulty posture. By 9 or 10 months most babies can sit without support for indefinite periods, and this represents a transitional stage between the supine (lying on the back) and the standing posture. At this juncture the child usually has reached the halfway mark in walking, and the world appears quite different to him from the way it looked when he was lying either on his stomach or on his back. Assuming and maintaining a sitting posture is not due to reflex activity, as is most of the behavior of the newborn. Rather, it is the result of the progressive development of the motor areas of the brain which govern movements in the neck, shoulders, and upper extremities.⁷ The various phases in the development of a sitting posture are well illustrated in Figure 36. Illustrations A 1, 2, and 3 show how passive the neo-

⁷ McGraw, "Neuro-Motor Maturation of Anti-Gravity Functions as Reflected in the Development of a Sitting Posture," *Journal of Genetic Psychology*, 1941, 59:155-175.



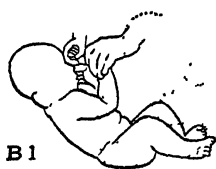
A1



A2



A3



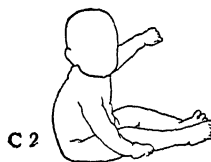
B1



B2



C1



C2



D1



D2



D3

FIG. 36. The Development of a Sitting Posture (From *Growth. A Study of Johnny and Jimmy*, 1935, by M. McGraw. By permission of the author and of Appleton-Century-Crofts, Inc., publishers.)

nate is when an adult tries to raise him from a supine to a sitting position. In B 1 the infant is beginning to take part in sitting up. The dotted line in B 2 shows how the upper part of the back is held to prevent falling forward. Note the active coöperation in trying to sit up in C 1. An erect sitting posture is shown in C 2. D 1 and 2 show the infant rolling over on his stomach in preparation for sitting up independently, and in D 3 he sits up without support.

So long as the baby is forced to stay wherever he happens to be left, his contacts will be from things or people brought to him. With the development of active locomotion, however, he gains increasing freedom and is subjected to a greater number and variety of experiences.

Changing from a prone to a sitting position and from a sitting back to a prone position may be mastered during the tenth or eleventh month. If given an opportunity to be on the floor, the child may be lured by some object to *crawl* from place to place. His abdomen is in contact with the floor, and he drags or pushes himself along with his arms and hands. Usually, a little later, he *creeps* by moving about on all fours with his abdomen raised. The transitional stages from crawling to creeping are illustrated in Figure 37 and are additional overt evidence of the progressive maturation of the nervous system.⁸ Parents may help their children in this phase of development by providing plenty of space and by keeping them free from tight or entangling clothing. Other forms of locomotion, such as hitching and scooting, may occur between crawling and creeping, depending upon individual growth factors and environmental conditions.

Before a child can walk without help he must be able to pull himself up to a standing position. Attempts at this often occur at the same time that he is creeping, and it is important that chairs and other furniture within his reach be stable enough not to topple over on him. At first the achievement of standing up fascinates the child, and he wants to do it over and over. For a few days, however, he does not know how to lower himself into a sitting position again, and may keep his mother busy assisting him until finally he discovers that he can do it for himself.

⁸ McGraw, "Development of Neuro-Muscular Mechanisms as Reflected in the Crawling and Creeping Behavior of the Human Infant," *Journal of Genetic Psychology*, 1941, 58:83-111.

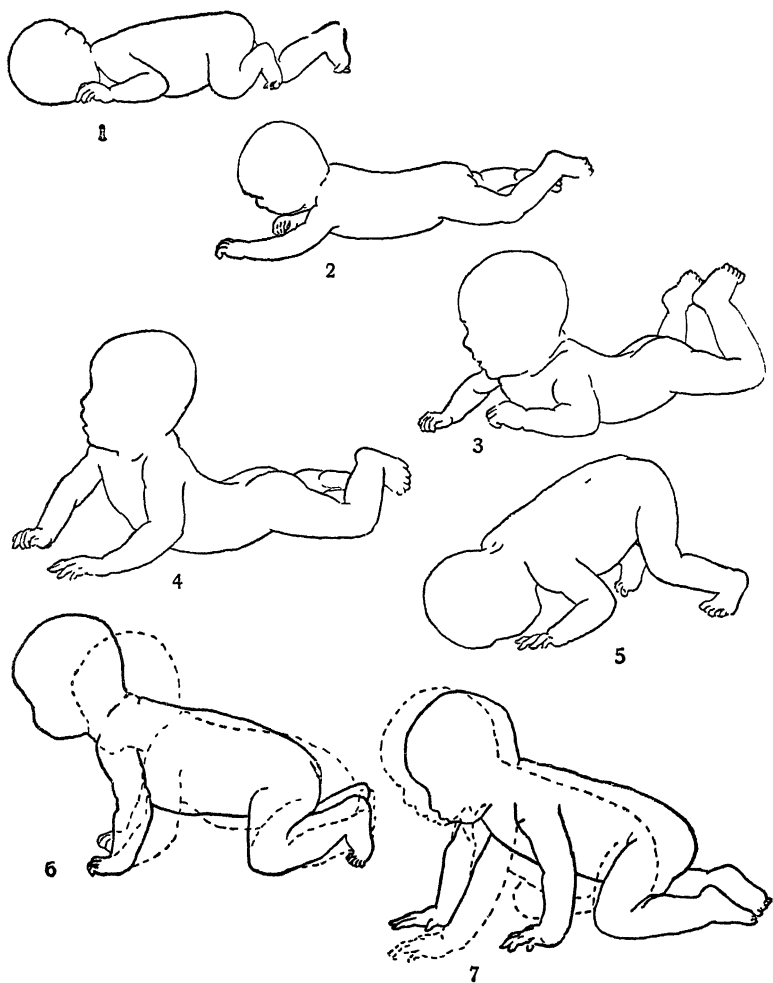


FIG. 37 Developmental Phases in Crawling and Creeping Pose number 1 shows the kind of crawling movements made by the neonate. In number 2 there is less activity in the lower extremities and the head is beginning to be held up. Number 3 shows greater control of head and shoulders. The development in the upper part of the body is still more marked in number 4. Number 5 shows how the head and shoulders are lowered when the pelvis is raised. Number 6 shows rocking movements, and in number 7 the infant is creeping. (From *Growth: A Study of Johnny and Jimmy*, 1935, by M. McGraw. By permission of the author and of Appleton-Century-Crofts, Inc., publishers)

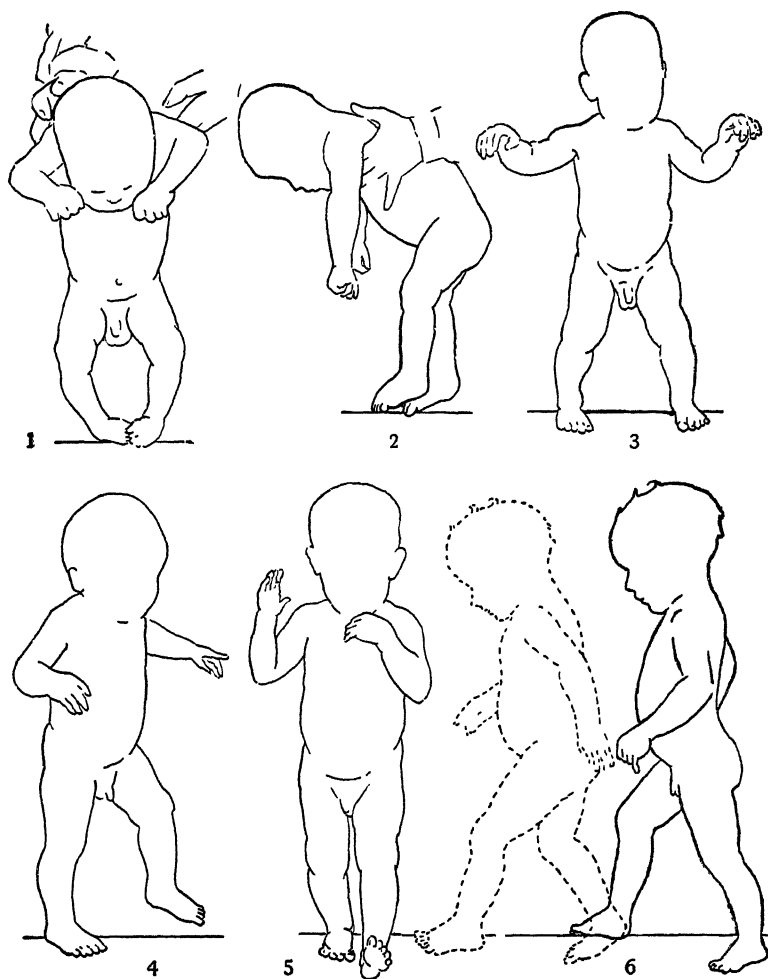


FIG. 38 Developmental Phases in Erect Locomotion. Number 1 shows the posture of the newborn when held up. In number 2 note the development in the upper part of the trunk. Numbers 3 and 4 show the first evidences of balancing and stepping movements. Number 5 shows balancing in walking independent of the upper extremities. Note how the child steps from heel to toe. Number 6 illustrates well-controlled walking (From *Growth. A Study of Johnny and Jimmy*, 1935, by M McGraw. By permission of the author and of Appleton-Century-Crofts, Inc., publishers)

After a child can stand, he may step around the object to which he is holding, and when his neuromuscular system has matured somewhat further, he will walk independently. Sometimes a toy lying beyond his reach interests him so much that he will walk unaided to get it, and if his efforts are commended he usually wants to

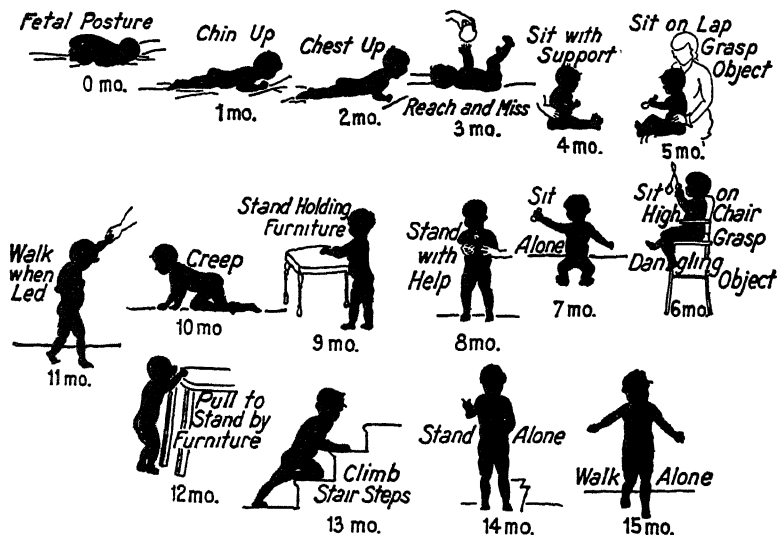


FIG. 39 The Motor Sequence. (From M. M. Shirley, *The First Two Years*, Vol. II. By permission of the University of Minnesota Press, Minneapolis.)

repeat the process again and again. The age at which walking without help occurs varies widely. Some children may walk independently at nine months, whereas others may not do so until 18 months, or even later. After a child can walk alone his mode of locomotion improves steadily. He walks faster, has more rhythmic coordination, and takes longer steps. The width and angle of his steps decrease, and instead of toeing out he walks straight ahead.⁹ The child's posture in standing and walking is clearly shown in Figure 38.

Sequences in the development of sitting up and walking are illustrated in Figure 39. They have also been well summarized by the late Miss Shirley under five orders of skills. This classification, based

⁹ L. H. Burnside, "Coordination in the Locomotion of Infants," *Genetic Psychology Monographs*, 1927, 2:279-372.

upon an intensive study of 25 babies over a two-year period is presented below.¹⁰

SEQUENCE FOR WALKING¹¹

| I. <i>First order skills</i> : Passive postural control | |
|---|-----------------------|
| Activity | Median Age (weeks) |
| On stomach, chin up | 3 |
| On stomach, chest up | 9 |
| Held under arms in erect position, makes stepping movements | 13 |
| On back, tenses or stiffens spine for lifting | 15 |
| Held erect, keeps knees straight | 15 |
| Sits on lap (support at lower ribs and complete head control) | 18.5 |
| (This marks the end of the first third of the walking sequence.) | |
| II. <i>Second order skills</i> . Postural control of entire trunk and undirected activity | |
| Sits alone momentarily | 25 |
| Makes knee push or swimming movements when placed on stomach | 25 |
| On back, rolling | 29 |
| Held erect, stands firmly with help | 29.5 |
| Sits alone one minute | 31 |
| (This marks the completion of one-half of the walking sequence.) | |
| III. <i>Third order skills</i> : Active efforts at locomotion | |
| Makes some progress on stomach by crawling (i.e., drags or pushes abdomen along on the floor by his arms) | 37 |
| Scoots backwards on stomach | 39.5 |
| IV. <i>Fourth order skills</i> : Locomotion by creeping | |
| Stands, holding to furniture | 42 |
| Creeps (abdomen lifted off floor, goes on all fours) | |
| (By this stage the child has accomplished two-thirds of the walking sequence.) | 44.5 |
| Walks when led | 45 |
| Pulls to standing position by holding on to furniture | 47 |

¹⁰ M. M. Shirley, *The First Two Years*, Vol. I, *Postural and Locomotion Development*.

¹¹ *Ibid.*, adapted from Table III, p. 99, and chap 6, by permission of the publisher. The University of Minnesota Press, Minneapolis, Minn.

| | |
|---|----|
| V. <i>Fifth order skills.</i> Postural control and coordination for | |
| walking | |
| Stands alone | 62 |
| Walks alone | 64 |

We have selected the principal stages in sitting up and walking from one of the numerous investigations conducted by Dr Gesell. The motor performances of at least 24 infants are given for each of 15 different age levels as follows:

NORMATIVE SUMMARY FOR WALKING¹²

| Activity | Most Frequent Age Range* (weeks) |
|---|--|
| Lifts head momentarily when on stomach | 4-8 |
| Raises upper chest when on stomach | 16-36 |
| Sits with body erect, supported | 20-28 |
| Sits with slight or no support, momentarily or better | 20-32 |
| Sits one minute or more | 32-40 |
| Rolls from back to stomach | 32-40 |
| Sits for indefinite period | 40-56 |
| Progresses (creeping, crawling, hitching) | 44-56 |
| Crawls | 40-52 |
| Creeps | 44-56 |
| Stands only when both hands are supported | 36 |
| Pulls to standing position | 48-56 |
| Stands independently without support | 56 |
| Walks using support | 48-56 |
| Walks independently | 56 |

*Based upon ages where 50 percent or more of the children showed the particular activity, or upon fewer cases considered significant

Children may omit some of the stages in the walking sequence previously described. The mother may not want her infant to be on a cold floor, or may have some other reason for limiting its activities. From 60 to 70 percent of all children walk between 11 and 14 months, almost all by 18 months. These figures, obviously, will vary with the groups studied. In Miss Shirley's investigation the earliest

¹² From Gesell and Thompson, *The Psychology of Early Growth* (The Macmillan Company, New York, 1938) By special permission of the authors, present holders of the copyright. Material adapted from Tables 21 on p 123, 27 on p. 131, 32 on p 137, and 31 on p. 135.

one to walk alone did so at 15 months, the average around 16 months, and the slowest at almost 17 months.¹³ There are a number of reasons for children's not walking at the average time. It is claimed that those who slide walk later than those who creep, and that bottle-fed babies are slower than those who are breast fed. Those who are undernourished or who have rickets may not be strong enough to walk. Heavy infants may be retarded by their weight, and Shirley maintained that "long-legged babies walk earlier than short-legged ones . . . thin muscular babies and small-boned babies walk earlier than short, rotund babies and exceedingly heavy babies."¹⁴ A more recent study of 349 infants, however, indicates that when age is held constant, neither weight nor body build was closely related to the onset of locomotion.¹⁵

The early occurrence of sensory defects, such as blindness and deaf-blindness, may retard seriously or even prevent the development of walking.¹⁶ The reason for this is not always entirely clear, but it may be due to lack of social stimulation, timidity, injuries resulting from early attempts at independent walking, or to a combination of these factors.

Children who have made normal progress in walking may be retarded by prolonged illness which keeps them in bed for a long time. Slippery floors, improper shoes, or unpleasant experiences, such as falls and bruises, may also retard the child's progress in walking. The age of walking cannot be forecast before the thirtieth week. "Fair prediction of a baby's walking age may be made by doubling his age at sitting alone or walking with help and by reckoning walking age as $\frac{3}{2}$ of creeping age."¹⁷

Mentally retarded children are late in walking, but all children who are slow in walking are not mentally subnormal. Terman¹⁸ found that gifted children walk about one month earlier than do

¹³ See Table III, p. 99, in *The First Two Years*, Vol. I.

¹⁴ *Ibid.*, pp. 120, 126.

¹⁵ W. Dennis, "On the Possibility of Advancing and Retarding the Motor Development of Infants," *Psychological Review*, 1943, 50:203-218, especially p. 209.

¹⁶ K. E. Maxfield and H. Fjeld, "The Social Maturity of the Visually Handicapped Preschool Child," *Child Development*, 1942, 13:1-27.

¹⁷ Shirley, *op. cit.*, p. 108.

¹⁸ L. M. Terman et al., *Genetic Studies of Genius* (Stanford University Press, Stanford, Calif., 2nd ed., 1926), Vol. I, p. 187.

average children, but Dennis¹⁹ cites a number of investigations showing that unusually high intelligence is not necessarily associated with early walking. The following figures show the age of walking for children of different levels of intelligence.

| Walking | |
|---------------|--------------|
| | (mean) |
| Normal | 13.88 months |
| Feeble-minded | 25.08 |
| Gifted boys | 13.10 |
| Gifted girls | 12.87 |

By the age of two the child ordinarily can walk sidewise and backward, but turns around with difficulty. He can climb onto boxes and furniture and can creep up three steps, but may descend by backward creeping or by sitting and bumping his way down. He can turn his head around as he walks and is beginning to run.

During the third year his walking becomes automatized, and he is more confident and daring. His running, also, has improved. He can jump with both feet placed together, can jump down from low objects, can stand on one foot for a brief time, and tries to turn somersaults.

By the time he is four, his walking is firmer, his running is more skillful, and he can alternate his feet in descending stairs.

By five years he can skip with both feet and can march to music, but cannot hop well.²⁰ The fifth year marks the establishment of all the basic forms of locomotion, some of which are highly developed. "Thereafter improvement consists of refinement of form and pattern and not of the establishment of new patterns."²¹

As mentioned before, some development takes place in the motor areas of the cerebrum, or upper brain, in infancy and early childhood. The cerebellum, or lower brain, which is concerned with postural control and balance, also grows rapidly during this time and practically reaches its full size before the fifth year. Its period of greatest growth occurs during the last half of the first year and

¹⁹ W. Dennis, "On the Possibility of Advancing and Retarding the Motor Development of Infants," *Psychological Review*, 1943, 50, 208-209.

²⁰ Adapted from Gesell et al., *The First Five Years of Life*, chap. 6, and Gesell and F. L. Ilg, *Infant and Child in the Culture of Today*. See also C. E. Skinner and P. L. Harriman (eds.), *Child Psychology*, chap. 4 by C. E. Ragsdale.

²¹ Skinner and Harriman (eds.), *op. cit.*, pp. 82-83.

the first half of the second year, when the child is rapidly gaining control of his body.²²

The California Infant Scale of Motor Development, reproduced below, shows the age levels from the first to the fifth years, at which different motor activities usually appear.

THE CALIFORNIA INFANT SCALE OF MOTOR DEVELOPMENT²³

| Test Items | Age Placement (months) |
|------------------------------------|---------------------------|
| Head erect—vertical | 1.9 |
| Head erect and steady | 2.9 |
| Turns from side to back | 3.4 |
| Sits with support | 3.5 |
| Holds head steady | 3.6 |
| Beginning thumb opposition | 4.1 |
| Sits with slight support | 4.6 |
| Turns from back to side | 5.0 |
| Partial thumb opposition | 5.1 |
| Sits alone momentarily | 5.7 |
| Pulls to sitting position | 6.2 |
| Rolls from back to stomach | 7.0 |
| Complete thumb opposition | 7.6 |
| Partial finger prehension | 7.8 |
| Sits alone with good coordination | 8.5 |
| Fine prehension with pellet | 9.3 |
| Raises self to sitting position | 9.4 |
| Pulls to standing position | 10.5 |
| Stands up | 10.6 |
| Walks with help | 11.6 |
| Sits down | 12.5 |
| Stands alone | 12.5 |
| Walks alone | 13.0 |
| Walks upstairs with help | 20.3 |
| Walks downstairs with help | 20.5 |
| Walks upstairs alone, marks time | 24.3 |
| Walks downstairs alone; marks time | 24.5 |
| Jumps off floor; both feet | 28.0 |

²² Gesell et al., *The First Five Years of Life*, p. 71.

²³ From Table I, p. 3, of N. Bayley, *The Development of Motor Abilities During the First Three Years*, Monograph No. 1, 1935. (By permission of the publisher, Society for Research in Child Development, National Research Council, Washington, D.C., and of the author.)

| | |
|---|------|
| Stands on left foot alone | 29.2 |
| Stands on right foot alone | 29.3 |
| Walks upstairs alternating forward foot | 35.5 |
| Walks tiptoe three meters | 36.2 |
| Jumps from height of 30 cm. | 37.1 |
| Distance jump—10 to 35 cm. | 37.3 |
| Distance jump—36 to 60 cm. | 39.7 |
| Jumps over rope less than 20 cm high | 41.5 |
| Distance jump—60 to 85 cm. | 48.4 |
| Hops on right foot less than two meters | 49.3 |
| Walks downstairs—alternating forward foot | 50.0 |

The reader will notice that there are discrepancies in the three foregoing tables as to the age levels when various motor activities occur. These may be attributed in part to the variation in the numbers of children studied and to differences in the descriptive phrases employed. In some of the norms the median performance for each age group is given, whereas in others the range between the slowest and the fastest child in each group is presented. The width of this range indicates clearly the marked individual differences existing in the motor development of infants.

By the time the child goes to school, he can participate in a wide number of locomotor activities. His walking is perfected, and he can run, climb, jump, dance, skip, and hop.

HOW THE INFANT GAINS CONTROL OVER HIS ARMS AND HANDS

As was pointed out earlier, grasping is possible even in prenatal life, and is again evident in the neonate. Early grasping, however, is quite different from the voluntary, digital technique used by adults. It is, in reality, a reflex response of the hand as a whole, occurring when an object is placed in it, and, as in the case of the Darwinian grasp (see p. 72), often is sufficiently strong to support the weight of the body.

The exploratory activities of the hand are of inestimable value to the child in getting acquainted with the world about him. Manipulation, when combined with vision, touch, "mouthing," and hearing, enables him to understand size, distance, and textures, and orients him to directions.

In the development of manipulation the eyes lead and the hands

follow,²⁴ and until the eyes and hands are coordinated, little progress can be made in prehension. At birth the eyes are uncoordinated and the ability to focus upon objects usually does not occur before the end of the second month. It will be about another month before the child can follow a moving object with his eyes.²⁵ Even in cases in which the vision is well developed at 16 weeks, one investigator²⁶ at Yale University found that no infant would touch a cube placed before him, but only stared at it for about five seconds. At 20 weeks, however, one-fourth of the babies touched the cube, and at 24 weeks, one-half of them did so. Between the ages of 28 and 40 weeks coordination between eyes and hands is established, and by 40 weeks *all* the infants touched the cube.

The length of time spent by the baby in staring at a cube increased from 4.75 seconds at 16 weeks to 18 seconds at 28 weeks. By the end of the first year, however, the amount of time spent in looking at an object decreased to 10.75 seconds.

The manner of reaching for a cube shows definite changes with increasing maturity, and three general patterns may be recognized.²⁷ Of these the earliest, or backhand type, occurs rather infrequently, while the second, or circuitous type, is the most common. The third, or straight approach, is the most mature, and is the ultimate goal in manual control.

Progress in manipulation depends not only upon the technique used in reaching but also upon the posture of the body. Reaching is dominated first by the shoulder, then the elbow, followed by the fingers, and finally by the wrist.

The first movement used in reaching is a backhand sweep, forming an incomplete arc. This is characteristic of the child between 16 and 28 weeks of age, or at about the time he is trying to sit up.

At 28 weeks the approach to an object is very circuitous, but by 36 weeks it is only slightly so. During this time the infant may shorten the distance between himself and the object by bending forward from a sitting position and rotating one shoulder. Movements in reaching are dominated by the shoulder during the first 40 weeks

²⁴ Gesell, *How a Baby Grows*, p. 6.

²⁵ Gesell and Ilg, *op. cit.*, chaps. 2 and 6

²⁶ H. M. Halverson, "An Experimental Study of Prehension in Infants by Means of Systematic Cinema Records," *Genetic Psychology Monographs*, 1931, 10:107-286.

²⁷ *Ibid.*, pp. 174-175.

after birth, but when greater participation of the elbow, wrist, and fingers occurs, a straight approach is possible. This is the third and final stage in reaching, and usually is accomplished between the ages of 40 and 52 weeks. From domination by the shoulder, as in the more immature patterns of approach, the arm is now controlled and aimed by the wrist and forefinger.

These three patterns in the development of reaching are not always clearly distinguishable, and progress from one to another fre-

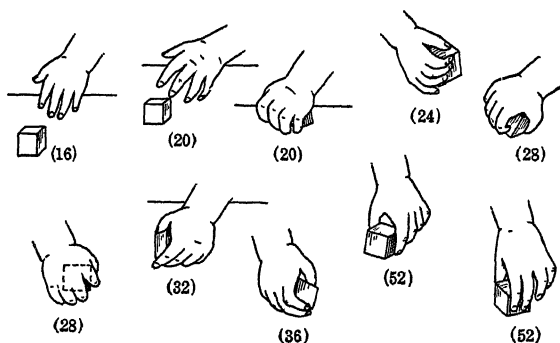


FIG. 40. The Development of Prehension in the Infant. (After H. M. Halverson, "An Experimental Study of Prehension in Infants," *Genetic Psychology Monographs*, 1931, 10: Nos 2, 3. By permission of The Journal Press, Provincetown, Mass.)

quently is irregular. By the age of one year, however, most children have achieved a fairly mature pattern of reaching, but adult performance may not be attained until the fourth or fifth years.²⁸

In addition to reaching movements the infant goes through a number of stages in developing the ability to grasp objects. An analysis of these activities has been made by motion-picture recordings at the Yale Clinic of Child Development. Some of the principal types of grasping are given in the accompanying illustration, Figure 40, showing ten hand positions at different age levels during the first year.²⁹

The first position shows that no contact is made with the cube at 16 weeks, although the child may stare at it for five seconds. The technique used by the 20-week-old infant is illustrated in positions 2

²⁸ McGraw, "Neural Maturation as Exemplified in the Reaching-Prehensile Behavior of the Human Infant," *Journal of Psychology*, 1941, 11:127-141.

²⁹ Halverson, *op. cit.*, pp. 212-215.

and 3. Here he does not grip the cube, but rather corrals it with his hand and squeezes it against his body or other hand. In the literature this type of prehension is referred to as a "primitive squeeze." The "squeeze grasp," shown in position 4, which occurs at about 24 weeks, is really the first evidence of an actual but clumsy method of grasping an object. The cube is gripped between the fingers and the palm of the hand. A refinement of this grasp, known as the "hand grasp," occurs at 28 weeks, and is shown in the fifth position. Here the fingers encircle the cube somewhat more effectively than at 24 weeks, with the thumb placed parallel to them. Thumb opposition is beginning at 28 weeks, as is shown in position 6, and at 32 weeks is quite evident in the so-called "palm grasp" illustrated in position 7. The fingers and thumb cooperate to hold the cube against the palm of the hand. Position 8 shows the cube being held by the tips of the thumb and fingers at 36 weeks. A refinement of this is shown in positions 9 and 10 at 52 weeks, when a superior forefinger grasp, or pincer movement, is established. The cube is now gripped between the ends of the fingers and the thumb, and can be held without resting the hand on the table.

Similar stages are evident in the hand approaches made in an effort to secure a small round sugar pellet.³⁰ Visual fixation for about two and a half seconds is characteristic at 20 weeks, and the attention is shifted to objects other than the pellet. Scratching movements occur at 24 weeks; raking movements resulting in prehension by the palms of the hands at 28 weeks, and thumb opposition and pincer movements beginning at 40 weeks.

The development in prehension during the first year is tremendous. At birth the child is unable to use his fingers as separate units, but by the end of 52 weeks he can use his fingers and thumb in pincer movements.

An excellent résumé of the development of reaching-prehensile behavior has been made by McGraw³¹ in a study of 1904 observations of 73 children from birth to four years. She summarizes her data under six so-called phases of development.

The phase which characterizes the infant during the first 35 days

³⁰ B. M. Castner, "The Development of Fine Prehension in Infancy," *Genetic Psychology Monographs*, 1932, 12 193 pages, see also Barker, Kounin, and Wright (eds.), *op cit.*, chap. 4 by Halverson, especially p. 56.

³¹ McGraw, "Neural Maturation as Exemplified in the Reaching-Prehensile Behavior of the Human Infant," *Journal of Psychology*, 1941, 11.127-141.

is called the "newborn or passive phase." At this stage of development the grasp is purely reflexive in nature and there is no real coordination between eyes and hands.

Around 115 days the second or "object-vision phase" occurs. This marks the beginning of fixation or regard.

The period around 210 days is called the "visual-motor phase," where eye and hand coordination of a compulsive rather than of a purposive type has been established.

Development around 360 to 375 days is characterized as the "manipulative and deliberative phase." Here the child shows sustained attention for the object and can deliberately inhibit the act.

The "visual release phase" follows. The child can appraise the situation in one brief look and then glance in another direction as he picks up the object.

The last or "the mature phase" is attained when "the child is able to appraise the location and size of the object without giving undue attention to it." He usually employs but one hand, and uses a light grip.

According to McGraw, cortical function does not enter into reaching-prehensile behavior until about the age of eight and a half months, and the adult phase is not perfected before the fourth or fifth year. This latter conclusion is not in accord with those of Gesell and Halverson, who feel that the mature level is reached by 60 weeks.

The parent who understands the sequence of development in reaching and prehension will surround his child with things which are appropriate to the infant's particular level of growth.³² Obviously, these will include articles of food, objects, and toys suitable to grab, chew, and explore.

At three or four months the baby may place his hands on the bottle or breast while sucking, and about a month later will pat it.

From about the sixth or seventh month on, the infant may put things in his mouth, and care must be taken to prevent him from getting hold of sharp or dangerous objects. This is especially true when he is cutting teeth, and wants hard things to chew.

At one year he may be able to hold a cup briefly, and may also try to manipulate a spoon, but usually turns the bowl sideways or upside down and makes quite a mess of things. Adults who understand

³² Gesell and Ilg, *op. cit.*; and M. L. Lerrigo, *Children Can Help Themselves*.

this phase of development, however, will not be too disturbed about it.

At the time that the pincer movement is developing the baby delights in poking into his cereal and in picking up crumbs from his tray, and finger feeding continues to be popular with him well into the second year.

If the year-old child is at that stage of development where he pulls himself to a standing position, he may insist upon standing up while he eats.

By the second year considerable manual progress has been made by the child. He does not spill so much when he eats, and usually he is quite adept in the handling of his spoon. He can manage his cup fairly well by this time, also, and his chewing has improved.

In another year he can use his fork skillfully, and can pour milk or water from a small pitcher into a glass.

Eating is a strenuous process for the young child and he tends to become fatigued and dawdles over his meals. This dawdling seems to reach a peak in most children at three or four years of age.

By the fourth year the child can eat and talk at the same time, and can now use a blunt knife. He tries to help his mother by assisting in clearing the table and putting food in the refrigerator.

The five-year-old usually gets much satisfaction from cutting his food with a knife, and his table manners are much more mature, but they still do not reach the standards which some mothers expect.

The growth of arm and hand control is illustrated, also, by the development of play behavior. At 24 weeks the baby will usually grasp a rattle, and ordinarily from 28 weeks to the last quarter of the first year he reaches for objects with both hands. Thereafter, he generally uses one hand but may transfer things from one hand to the other. The ability to release objects³³ begins around the age of 28 weeks, but dropping them *voluntarily* on the table or floor usually does not occur before the child is 44 weeks old, when he tends to keep everyone busy picking up things he drops.

At six months a baby may throw a ball from a sitting position, but coöperative ball play is not evident before 13 months. The child can catch and toss at two years, and his basic pattern of throwing is fairly well established by the time he enters school.³⁴ A more detailed

³³ Gesell et al., *The First Five Years of Life*, chap. 6

³⁴ Lernø, *op. cit.*; also Skinner and Harriman (eds.), *op. cit.*, pp 87-88.

discussion of play activities will be found in Chapter 10, together with a list of toys suitable to different age levels.

THE DIRECTION OF GENERAL MOTOR DEVELOPMENT

In Chapter 3 we saw that prenatal development proceeds in a head-to-foot direction, and also from the center outward to the periphery of the body. These developmental trends have been recognized since the time of Aristotle,³⁵ and were revived by Preyer and later by the experimental embryologists. They are now known as the law of cephalocaudal development, which literally means "head to tail," and the law of proximodistal development, meaning "near to far." According to the first law, "motor control sweeps downward from the eye and head region toward the lower trunk, pelvic and sacral regions," while the second law shows that motor control "progresses outward in the limbs from shoulder to finger tips, and from hip to toes."³⁶

A consideration of the walking sequence already described will show that the laws both of cephalocaudal and of proximodistal development operate clearly in this aspect of motor growth. The development of reaching-prehensile behavior is governed primarily by the proximodistal law, although posture, which is closely related to prehension, tends to follow the cephalocaudal sequence.³⁷

WHICH IS THE PREFERRED HAND?

Many theories have been advanced to explain hand preference, and some research has been done on this problem.³⁸ Nevertheless, there is still much confusion as to the factors responsible for hand dominance, and as to when it first appears in the child. There is also

³⁵ C. Murchison (ed.), *Handbook of Child Psychology*, "Origin and Prenatal Growth" by L. Carmichael, p. 79 (Clark University Press, Worcester, Mass., rev. ed., 1933).

³⁶ *Ibid*, p. 247, "Locomotor and Visual Manual Functions in the First Two Years" from *The First Two Years*, Vol. I, by M. M. Shirley.

³⁷ A. Gesell and L. B. Ames, "The Ontogenetic Organization of Prone Behavior in Human Infancy," *Journal of Genetic Psychology*, 1940, 56:247-263.

³⁸ N. V. Scheidemann, *The Psychology of Exceptional Children* (Houghton Mifflin Company, Boston, 1931), chap. 5; M. Giesecke, "The Genesis of Hand Preference"; "Handedness," by W. F. Bruce and B. B. Friedman, pp. 356-358, in H. N. Rivlin and H. Schueler, *Encyclopedia of Modern Education* (The Philosophical Library, New York, 1943); also R. M. Dorcus and G. W. Shaffer, *Textbook of Abnormal Psychology* (The Williams and Wilkins Company, Baltimore, 1945), pp. 90-99.

a great deal of controversy about the desirability of changing a child's hand preference as well as the procedure to be followed if such a change is contemplated.

Until recently one of the most widely held explanations of handedness was the so-called theory of cerebral dominance. According to this hypothesis, the right hemisphere of the brain governs the left side of the body, while the left hemisphere controls the right side of the body. It is believed that one cerebral hemisphere tends to be dominant, and that this determines the preferred hand. Some writers have suggested that this supposed dominance of one hemisphere over the other is caused by an unequal blood supply to the two cerebral hemispheres during prenatal development. Ordinarily, the left side of the brain receives a somewhat greater blood supply, and, as a consequence, it usually is dominant, resulting in a right-handed individual. If, as happens less frequently, the right hemisphere receives a greater blood supply, it dominates activity, and the individual is left-handed. However, if the blood supply to the two cerebral hemispheres is equal, no dominance is developed, and the individual is ambidextrous. Other writers have maintained that hereditary factors determine cerebral dominance and consequently hand preference. Whatever may be the cause of cerebral dominance, the advocates of this theory believe that any attempt to change a child's preferred hand is undesirable. They claim that such efforts may produce serious nervous tension, often resulting in speech difficulties, such as stuttering and stammering.

The theory of cerebral dominance has been subjected to a number of criticisms. Experimental attempts to show that certain areas of the brain are invariably associated with specific motor activities indicate that it tends to function as a whole rather than as a series of specialized parts.³⁹ If some damage occurs to a specific motor area, the remainder of the brain will take over its function to some extent. The assumption that cerebral dominance is caused by unequal blood supply to the two hemispheres of the brain is not justified, because investigations have shown that a communicating artery equalizes the distribution of blood.⁴⁰ It is questionable, also, if cerebral dominance

³⁹ K. S. Lashley, "Coalescence of Neurology and Psychology" (Symposium on Recent Advances in Psychology), *Proceedings of the American Philosophical Society*, Philadelphia, 1941, pp 461-470.

⁴⁰ Scheidemann, *op. cit.*, p. 132

can be attributed to Mendelian inheritance. Nor does experience substantiate the claim that changing a child's preferred handedness necessarily results in nervous tension and speech defects. Over a period of four years in the schools of Elizabeth, New Jersey, left-handedness was reduced from 250 to 66 cases without the occurrence of a single instance of defective speech.⁴¹ It has been shown elsewhere that 81.4 percent of children who stuttered did so before given any instruction in handwriting, so that changing handedness could not be considered a causal factor.⁴²

In Chapter 3 attention was called to the possible relationship between right- or left-handedness and the position of the fetus in the uterus. It is claimed that either the right or left arm may be compressed during the latter part of pregnancy, and since the free arm receives more exercise, it will be the more skillful of the two. However, in a study of the relationship of eyedness and handedness to fetal position in 85 subjects, one investigator found practically no correlation.⁴³

It was mentioned also in Chapter 3 that the tonic neck reflex (t-n-r) which develops early in prenatal life is related closely to posture, eyedness, and handedness. In rightward t-n-r the fetal infant's head is oriented toward the right, and, therefore, he is in a position to regard the activities of his right hand. In leftward t-n-r the reverse is true, and the infant tends to regard the left hand. This early t-n-r orientation is thought to be the basis for both eye and hand dominance, although it is not a fixed response and passes through a number of maturational changes. That the t-n-r is an important factor in handedness is shown in an investigation at Yale University.⁴⁴ In 77 percent of the cases studied, the fetal infant's head was oriented toward the right, and in 14 out of 19 instances, this rightward t-n-r was predictive of later handedness. This theory, that handedness originates in the t-n-r, emphasizes the fact that it is actually the result of eye preference. Furthermore, eyedness and handedness are considered to be related aspects of lateral dominance or of general sidedness. Lateral dominance also should include foot-

⁴¹ *Ibid.*, p. 142.

⁴² J. F. Bender, "Do You Know Someone Who Stutters?" *Scientific Monthly*, 1944, 49, 221-225.

⁴³ Dorcus and Shaffer, *op. cit.*

⁴⁴ Gesell and Ames, "The Development of Handedness," *Journal of Genetic Psychology*, 1947, 70:155-175.

edness, but its relationship to eyedness and handedness is not so clear. Generally, however, individuals who are right-eyed and right-handed tend also to be right-footed.

The popular notion that all individuals can be classified as being either right- or left-handed has not been confirmed by recent studies. Complete right-handedness or left-handedness is seldom found at any age level and this is especially true during the first year of life. Early shifts in handedness are shown in the more carefully recorded baby biographies of the later nineteenth and early twentieth centuries.⁴⁵ A recent analysis of handedness in children from 8 weeks to 10 years of age was made at Yale University, using cinema and stenographic records. Seven cases were completely checked over the entire age span and the number of cases studied at each of the different age levels ranged from 12 to 45. Results showed that shifts in handedness occurred during the first year as well as at other levels. The four major patterns of handedness occurring during the first year were:

1. Right-handed behavior
2. Left-handed behavior
3. Bilateral behavior (both hands used)
4. Bidextrous behavior (either right or left used).

There is marked bilaterality at 18 months, followed by a tendency to use the preferred hand at two years. Between the ages of two and a half and three and a half, bilaterality appears again, but after four years, with some exception, the dominant hand is generally used.⁴⁶

If handedness is dependent upon the development of the fetal t-n-r, then it is largely a product of growth. Early shifts in hand preference are the result of immature structure, and the general establishment of hand dominance by the age of four years indicates that the maturational process is fairly complete. The t-n-r theory of lateral dominance seems credible in many respects, but it fails to offer a satisfactory explanation of mixed dominance, wherein an individual may be either left-eyed and right-handed, or right-eyed and left-handed. In some instances it can be shown that left-eyed individuals actually prefer the left hand but have become accustomed to using

⁴⁵ Giesecke, *op. cit.*, pp 1-2.

⁴⁶ Gesell and Ames, "The Development of Handedness," *Journal of Genetic Psychology*, 1947, 70:155-175.

the right hand because of cultural pressure. Nevertheless, mixed dominance occurs frequently where there has been no attempt to change handedness.⁴⁷ Furthermore, as we mentioned previously, footedness should constitute a part of lateral dominance, but its relationship to eyedness and handedness is by no means clear.

In the light of present evidence it is impossible to classify people sharply as either right- or left-handed. Most individuals show some degree of ambidexterity, and whether they use the preferred hand or not depends largely upon the nature of the task being performed. Heretofore, there has been a tendency to oversimplify this problem; it is now clear that hand preference cannot be ascribed to any single cause. Numerous shifts in handedness occur at all ages, and many factors, both innate and acquired, probably operate in the determination of hand preference.

Estimates of the incidence of left-handedness in our population a decade or more ago ranged from 2 to 30 percent, but more conservative figures were from 2 to 6 percent.⁴⁸ A recent survey of 365 schools in the state of Michigan showed that 8.2 percent of 225,000 pupils were left-handed, and that the number is increasing. The author feels that this trend is the result principally of environmental factors.⁴⁹ No doubt these include more tolerant attitudes on the part of parents and teachers toward permitting a child to use his left hand, and to the fear that forcing a change in handedness might lead to disabilities in writing, reading, and speech. As we have seen, however, this fear is not wholly justified in actual experience. There is still much controversy over the question of changing handedness, but there seems to be an increasing belief that children should be encouraged to use the right hand if possible. The world still is primarily adapted to right-handed people, and the left-handed individual often is at a considerable disadvantage. Obviously, if attempts to change handedness produce undesirable results, they should be abandoned. However, if care is taken in the methods employed to bring about the change, it seems probable that many children who show an early preference for the left hand can become right-handed without any adverse effects.

⁴⁷ Scheidemann, *op cit.*, pp. 139-140.

⁴⁸ *Ibid.*, p. 138.

⁴⁹ G. E. Carrothers, "Left-Handedness Among School Pupils," *American School Board Journal*, 1947, 114:17-19.

HOW FINER MOTOR SKILLS DEVELOP

Thus far our discussion has dealt for the most part with the maturation of gross motor activities, which are concerned primarily with the larger movements of the body. Usually, after the age of five, these basic overt movements are fairly well established, and their growth is much slower than it was in the earlier years. In the remainder of this chapter we shall place greater emphasis upon the finer muscular coordinations which are more susceptible to exercise and training. As we have implied in our treatment of posture, walking, and manipulation, these three types of abilities are closely correlated in the performance of everyday motor activities. In the case of fine motor skills, however, there appears to be no such correlation, and the present trend is to speak of motor *abilities* rather than of motor *ability*.⁵⁰

The principal motor abilities have been classified as:

1. Speed of voluntary movement
2. Precision or accuracy of voluntary movement
3. Steadiness or control of voluntary movement
4. Strength of voluntary movement

Experimental studies have shown that these four abilities are relatively independent of each other. For instance, an individual may be proficient in one or two and not necessarily so in the others. A practical illustration is furnished by a nine-year-old boy of average intelligence who learned to fold paper boxes but was unable to cut out a jack-o'-lantern from a pumpkin after repeated instruction and experience. Other examples of the specificity of motor skills are seen in the following cases: (1) a seventh-grade girl can write well, but can make only the crudest kind of stitches in sewing, (2) a fourth-grade boy can hammer skillfully, but constantly breaks the blades when he uses a μ g saw; (3) a fifth-grade boy built a birdhouse successfully, but was unable to paint it evenly, and spilled paint on the floor and on himself; and (4) an adolescent boy swims well but is unable to dance or to do gymnastic exercises rhythmically.

Attempts have been made to devise methods for appraising the

⁵⁰ See E. Garfil, "The Measurement of Motor Ability," *Archives of Psychology*, 1923, 62, F. A. Kiefer, "Manual Motor Correlation in Superior Children," *Journal of Applied Psychology*, 1929, 13 357-371; F. A. C. Perrin, "An Experimental Study of Motor Ability," *Journal of Experimental Psychology*, 1921, 4:24-56, Henry (ed.), *op. cit.*, p. 100

four basic motor abilities listed above. The measurement of pure motor capacities is difficult, however, since the situation is complicated by the presence of various extraneous factors. For instance, an individual may fail in these motor tasks because he is handicapped by poor vision. He may have insufficient intelligence to comprehend the instructions, or he may be unwilling to cooperate. The measurement of the motor performances of preschool children, especially those below four years, is particularly difficult. Their language development usually is so immature that they cannot understand the necessary directions. Their attention span is very brief, and they may be penalized on a timed test because they do not realize the importance of speed, and work too leisurely. Nevertheless, as we have seen, the child usually possesses considerable manual skill by the close of the preschool period. He can handle a spoon, fork, and knife and can undress and dress himself with help, although these achievements are hard to assess objectively.

Despite their limitations, some motor tests for the preschool level are available and are useful in securing information about the child's motor development. Those designed for more advanced age groups, although subject to criticism, may yield a fairly satisfactory estimate of an individual's motor abilities, which may be helpful in practical situations. Some of these tests are described in the following section.

HOW MOTOR CAPACITIES ARE MEASURED

MOTOR TESTS FOR PRESCHOOL CHILDREN⁵¹

Speed of movement has been measured by such simple tests as:

1. Punching holes in paper
2. Placing pegs in pegboards
3. Sorting cards into boxes
4. Buttoning strips of cloth
5. Fitting cubes into a box

Precision or accuracy of movement has been gauged by the child's ability to:

⁵¹ Consult B. Wellman, "The Development of Motor Coordination in Young Children," *University of Iowa Studies in Child Welfare*, 1926, 3; F. L. Goodenough, "A Further Study of Speed of Tapping in Early Childhood," *Journal of Applied Psychology*, 1935, 19:309-319

1. Draw a line between two converging lines printed on a page
2. Trace paths and mazes with a pencil
3. Hit at targets
4. Strike crosses on a paper with a pencil
5. Toss rope rings on sticks
6. Throw balls and bean bags
7. Copy characters
8. Build pyramids with blocks

Steadiness, or control of voluntary movement, may be determined by:

1. The number of clicks made when holding a metal stylus in an apparatus containing holes of various sizes and wired in circuit with batteries, a telegraph sounder or buzzer, and an automatic counter
2. The ability to balance on a walking board without stepping off

Strength of voluntary movement is measured by:

1. Pulling weights
2. Squeezing specially constructed instruments called dynamometers. See Figure 44 for an illustration of a hand dynamometer.

MOTOR TESTS FOR SCHOOL-AGE CHILDREN AND ADOLESCENTS⁵²

Motor tests for children of school age as well as for adolescents have been adapted from those designed for adults, some of which have been employed in the psychological laboratories since 1892

Speed of movement has been appraised by two methods: (1) a telegraph key is pressed and released as rapidly as possible. The apparatus used is an ordinary telegraph key wired in circuit with an automatic counter (Veeder), which registers the taps, and from which one can determine how rapidly a child can move his finger. (2) The number of taps made in one minute on a metal plate is recorded. A metal stylus is used to tap the plate, which is wired in circuit with batteries and an automatic counter. See Figure 41.

⁵² Consult Kiefer, *op cit.*, especially pp 362-367, also J. Tiffin, F. B. Knight, and E. J. Asher, *The Psychology of Normal People* (D. C. Heath and Company, Boston, rev. ed., 1946), chap. 7.



FIG. 41 Purdue Tapping Test. (Photographed in the Morris Harvey College Psychological Laboratory by permission of Dr. Joseph Tiffin, Purdue University. Sold by the Lafayette Instrument Company, 26 N. 26th Street, Lafayette, Ind.)

Tests for *precision or accuracy of movement* include: (1) placing brass pins into holes with the fingers; (2) putting metal pins, one at a time, into 100 holes drilled in a metal plate, using a small pair of tweezers; (3) tracing a path between two rulers (The tracing board consists of a block of wood upon which a piece of glass is mounted. Rulers with brass strips are placed in an oblique position, converging at one end and raised on either side of the glass. A metallic pencil is wired in circuit with a telegraph sounder or buzzer, which clicks or buzzes whenever an electrical contact is made with the brass strips. The score may be the distance traced without touching either strip, or the number of contacts made while tracing the entire distance. See Figure 42.); (4) inserting a stylus rapidly into three holes of an equilateral triangle as many times as possible in 60 seconds.

Steadiness, or control of voluntary movement is measured by the steadiness tester already referred to in the section on tests for the preschool child. The apparatus consists of a steel plate set in a frame at an angle of 45 degrees. It contains nine round holes arranged in

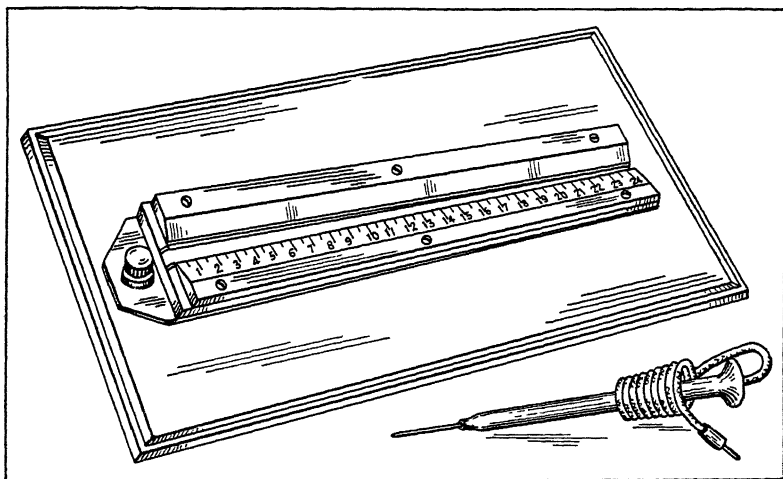


FIG 42 The Whipple Tracing Board. (Courtesy of C H. Stoelting Company, 424 N. Homan Avenue, Chicago 24, Ill)



FIG 43. Whipple Steadiness Tester. (Photographed in the Morris Harvey College Psychological Laboratory by permission of Dr Joseph Tiffin, Purdue University. Sold by C. H. Stoelting Company, 424 N Homan Avenue, Chicago 24 Ill.)

two rows, four in the upper and five in the lower. The holes decrease in size from the left-hand one in the top row, which is $\frac{1}{2}$ inch in diameter, to the right-hand one in the lower row, which is $\frac{7}{64}$ inch in diameter.

The individual is required to hold the stylus in a hole for 15 seconds, and tries to avoid touching the sides, which produces a click or buzz. The subject usually starts with the fourth hole, the smallest in the top row. If he makes 12 or more clicks he is urged to try the next larger hole. If 4 to 12 clicks are made, a smaller hole is attempted. If three or fewer clicks occur, the subject is asked to try the second smaller hole. The record is the smallest hole reached, and the number of contacts made in that hole for each hand. See Figure 43.

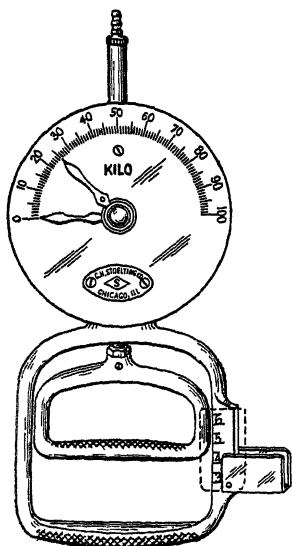


FIG. 44. A Hand Dynamometer (Courtesy of C. H. Stoelting Company, 424 N Homan Avenue, Chicago 24, Ill)

A dynamometer is generally employed to measure *muscular strength*. Figure 44 shows the type used to measure strength of grip. This instrument is held in the hand with the dial facing outward and away from the body. It has two grips which can be adjusted so that the lower edge of the upper grip lies along the base of the middle fingers and the lower edge of the lower grip lies against the heel of the hand. The subject is instructed to squeeze the grips together as hard as he

can, and the amount of pressure exerted is registered in kilograms on the dial. Back strength and leg strength are tested by either back or leg dynamometers.

WHAT ARE THE RESULTS OF MOTOR TESTS?

Results of simple motor tests indicate that speed of voluntary movement increases at a fairly uniform rate throughout childhood. However, the yearly gain between the ages of two and a half and four and a half is more than twice as great as it is between four and a half and five and a half years. The six-year-old taps about two-thirds as well as the adult, and the movements at the shoulder, elbow,

and wrist are nearer adult performances than is finger tapping. It has been found that "kindergarten children make about four taps per second, eight-year-old children about five, and eighteen-year-olds about six and one-half. The unpracticed college student makes six to seven taps per second and increases to nine to eleven per second with comparatively brief practice."⁵³ Differences between the sexes in speed of voluntary movement are negligible during childhood, but men are slightly faster than women.

Improvement in accuracy of voluntary movement is rapid during the preschool and early elementary school periods. At six years of age the child is about twice as accurate in his movements as he is at three years, and this increase in accuracy continues throughout childhood and adolescence. No significant sex differences are observable at any age level.

Although age norms on steadiness of movement are lacking, there is reason to believe that this capacity shows definite improvement during childhood and youth. No sex differences in steadiness have been demonstrated as yet.⁵⁴

Strength is one of the most variable motor capacities. Each year, from seven through the teens, there is a more rapid increase in strength than in height or weight. In a survey of private school pupils it was found that strength of grip for boys and girls increased 65 percent from 3 to 6 years. From 6 to 18 the boys increased 359 percent, and the girls 260 percent.⁵⁵ Other data show that strength of the upper back develops more rapidly between 7 and 12 years than does strength of grip, and exceeds height and weight in variability. The California studies, referred to in Chapter 1, showed that strength is a sensitive indicator of maturity. The peak for this capacity usually occurs between 12 and 13 for girls and between 15 and 16 for boys.⁵⁶ In general, boys are superior to girls in strength at all ages and their superiority is particularly marked after adolescence. Strength is influenced greatly by disease, exercise, nutrition, rest, and similar environmental conditions. Homes and schools, therefore, should provide for the maximum development of this important motor capacity.

There is lack of agreement as to the relationship between intellec-

⁵³ Skinner and Harriman (eds), *op. cit.*, pp. 91-92.

⁵⁴ *Ibid.*, p. 94.

⁵⁵ N. Bayley and A. Espenshade, "Motor Development from Birth to Maturity," *Review of Educational Research*, 1944, 14:381-382.

⁵⁶ Henry (ed.), *op. cit.*, p. 101.

tual and motor abilities. Some investigators have reported that there is a positive correlation between motor capacities and intelligence at the preschool level. This may be accounted for partly by the fact that intelligence tests for preschool children include a large proportion of motor tasks. With advancing age, however, the correlation between intelligence and motor performances declines. A study of the manual motor abilities of a group of 95 bright children between 8 and 12 years of age matched with 97 average children of the same age revealed no significant relationship between intelligence and motor capacities.⁵⁷ In another survey made on 202 girls between the ages of 11 and 17 no correlation was found between intelligence and motor abilities.⁵⁸

COMPLEX MOTOR SKILLS AND MECHANICAL ABILITIES

In addition to specific motor abilities, there is steady growth in the more complex gross motor skills from school entrance onward. The most rapid improvement takes place between the ninth and twelfth years, and at this period children enjoy skills of all sorts, as is evidenced in their play. Swimming, skating, bicycling, and competitive sports involving motor skills are very popular. After adolescence there is even greater participation in organized, competitive athletics, as well as interest in social skills, such as dancing. These activities will be considered in more detail in our discussion of play in Chapter 10.

Some tests have been devised to gauge such complex motor abilities as general strength, balance, skill, and agility. For example, the Brace Scale⁵⁹ comprises 20 items of achievement in motor performance, based upon 1555 students distributed from the fourth grade through college and ranging in age from 8 to 48 years. The following "stunts" are representative:

1. Folding the arms, crossing the feet, then sitting down cross-legged and rising again
2. Maintaining one's balance for 10 seconds or longer by standing on one foot with the eyes shut

⁵⁷ Kiefer, *op cit.*, p. 369.

⁵⁸ Bayley and Espenschade, *op. cit.*, p. 383.

⁵⁹ D. K. Brace, *Measuring Motor Ability: A Scale of Motor Ability Tests*; Henry (ed.), *op. cit.*, pp. 115-116, and Goodenough, *Developmental Psychology* (Appleton-Century-Crofts, Inc., New York, 2nd ed., 1945), p. 476.

3. Jumping into the air, making a full turn to the right or left (as instructed), and landing on the same spot
4. Jumping to the feet from a kneeling position
5. Kicking either the right or the left foot up to a point at least level with the shoulder
6. Walking in a straight line, heel to toe
7. Jumping into the air, slapping both heels with hands

In general, boys are superior to girls in activities involving large muscles and those requiring strength, general bodily speed, and endurance, whereas girls excel boys in more delicate movements involving eye-hand coordination and in body balance, as in dancing and fancy skating. It has been suggested that these sex differences are accentuated by the fact that girls lose interest in athletic activities, especially after adolescence, and, therefore, do not practice them. It is probable, too, that social and cultural factors help to determine the types of activities chosen by girls.

Besides the Brace and similar tests, achievement standards covering ages 8 to 19 have been set up by the National Recreation Association for various skills in games, track and field events, gymnastics, and water sports.⁶⁰ Such standards are most useful to physical education instructors, scout leaders, and playground supervisors.

The extent to which motor capacities can serve as a basis for vocational guidance is problematical. It is often assumed that motor skills are the chief components of mechanical abilities, but an analysis of mechanical tests has indicated that perceptual factors also play an important role. Elements such as manipulative speed are highly specific to the situation in which they are used. This means that a superior speed performance on one kind of test would not necessarily guarantee comparable success in a different type of operation. Many batteries of tests are available which purport to measure complex mechanical abilities, but their results probably are influenced greatly by differences in general intelligence, motivation, training, etc.⁶¹ Furthermore, there is no clear indication as yet that mechanical aptitudes exist as definite measurable abilities. When it is remembered that more than 17,000 separate jobs have been analyzed and classified, the idea that specific vocational guidance can be given on the basis of tests alone is fantastic.

⁶⁰ Skinner and Harriman (eds.), *op. cit.*, pp. 98-99.

⁶¹ Henry (ed.), *op. cit.*, pp. 139-141.

GUIDING THE DEVELOPMENT OF MOTOR SKILLS⁶²

A knowledge of some of the basic principles governing motor control is essential if effective guidance is to be given in the development of these abilities. Muscles are arranged in pairs, and while one contracts the other relaxes. When both muscles contract, there is no motion. Good coordination of movement, therefore, requires a balance between the relaxing and contracting phases of these antagonistic muscles.

Nagging, sarcasm, and ridicule cause emotional disturbance, which makes the individual tense and awkward. On the contrary, freedom and praise encourage relaxation and better coordination. The negative aspect of this general principle is well illustrated in the gymnastics of the traditional school, where formal drills and calisthenics were emphasized and even slight errors were punished severely.

Children and adolescents quite frequently have poor posture, which may be due to weak or badly controlled muscles or to excessive rapid growth. Proper remedial exercises, or massage, may help in correcting such conditions. Good results are now being obtained by trained physiotherapists who work with those whose muscles have weakened or atrophied from disuse or through diseases, such as infantile paralysis or cerebrospinal meningitis.

Muscular fatigue refers to the decrease in the amount of work done in a given time as a result of *continuous* effort. Children between the ages of 6 and 9 are more prone to fatigue than are those between 9 and 12. Fatigability often is high, also, during the prepubescent and early adolescent growth spurt with a subsequent decline when maturity is attained. The home, therefore, should arrange routines so as to allow a succession of work and rest periods with opportunities to relax before meals and going to bed. Adequate rest and sleep are essential also during adolescence, but cooperation usually is difficult to obtain from individuals at this age because of their increased activities and their desire to appear grown up. The school should arrange its class schedules so that rest periods and recesses occur at strategic times during the day.

In helping individuals to perfect complex motor skills, such as writing, piano playing, skating, swimming, playing ball or tennis,

⁶² J. J. B. Morgan, *Child Psychology* (Rinehart and Company, Inc., New York, 3rd ed., 1942), pp. 164-169.

etc., variations should be suggested to permit new motor adjustments. For example, the teacher of swimming does not rely upon one or two devices but encourages the use of different strokes, and hence different muscles.

In general, the introduction of rhythm into motor performances results in smoother coordinations and increases speed. This is especially true in cursive writing, descriptive counting is used in the primary grades and numerical counting in the middle grades. To illustrate: the descriptive method uses the phrase "around and up" to show the child that the letter *a* is made with three motions, whereas the numerical method substitutes the numbers "1, 2, and 3" while the movements are being made. Speed and accuracy in typing, also, are facilitated by rhythm, and the rhymes accompanying the bouncing of a ball, and work songs of manual laborers are further illustrations of this principle.

From the standpoint of learning, one's attention should be directed to the end result of the skill, rather than to the movement itself. Thus, the good writer watches his letters, words, or sentences, rather than the movement of his arm, wrist, or fingers. Furthermore, in games and sports, attention should be directed to the individual or group goal, rather than to an analysis of the movements involved. It is doubtful, too, if the breaking up of a complex skill into its component parts, and practicing them separately, improves one's performance in the skill as a unit. Nevertheless, this procedure has been employed in the teaching of writing by making pupils practice "ovals" and "push and pulls" as an aid to the formation of letters. Physical education instructors also violate this principle of unity when they separate particular skills from the complex of abilities involved in a game and concentrate upon them.

The observance of the foregoing principles in guiding the development of motor skills should increase efficiency and add greater interest to the performance of these activities.

THE SOCIAL IMPORTANCE OF MOTOR SKILLS⁶³

It is obvious that motor skills are essential elements in educational and vocational success. Parents and educators, however, are becoming increasingly aware of their importance in the socialization of children and youth. Individuals who lack the motor abilities neces-

⁶³ Goodenough, *op. cit.*, pp. 474-475, and Henry (ed.), *op. cit.*, pp. 117-120.

sary for effective participation in the types of group activities characteristic of their age level tend to withdraw and become isolated, or engage in simple activities with younger children whom they can dominate. These situations are being met to some extent by encouraging a greater variety of play activities so that the child who is deficient in one motor skill may have an opportunity to excel in another. This gives him a sense of achievement, which is so important in the development of motor performances. More effective guidance and instruction on the part of the teacher or group leader, also, will often bring an inferior motor skill to a level of performance which will enable the individual to compete successfully with his peers. Those with limited academic ability, also, frequently are able to excel in some motor skill which enables them to feel successful and to gain social status. It should not be inferred from this, however, that *all* individuals with inferior intelligence should be relegated to classes in manual training! In some instances, too, the timid child may refuse to join in group games because he feels inferior and is afraid of the ridicule of others. When this occurs the wise leader encourages the group to choose a simple game which the withdrawing individual can play without difficulty. Timidity and self-consciousness are especially evident at adolescence and are aggravated by the unthinking remarks of other adolescents and adults. Examples are seen in such nicknames as "butterfingers" and "lummox," and in the case of an exasperated mother's saying to her teenage son who accidentally upset a lamp: "Well, I suppose you can't help being awkward. You are all arms and legs." Some writers believe that the awkwardness characteristic of the adolescent years stems primarily from the emotional tension caused by such ridicule rather than from uneven growth, as others claim.

It is realized now that individuals who do not possess motor skills appropriate to their level of development usually become "wall-flowers" or "fringers," and that this tendency to withdraw may persist into the adult years.

SUMMARY

By motor abilities we usually refer to various types of bodily movement resulting from the coordinated activity of nerves and muscles. For convenience, these are classified as fine and gross motor abilities,

but in everyday experiences there is much overlapping between them.

Experimental evidence shows that maturation is the most important factor in early motor growth. Training has little effect unless the child's neuromuscular system is sufficiently mature to profit by it.

The development of sitting up and walking follows a definite pattern, but the rate varies from individual to individual. The walking sequence begins when the baby is able to hold his head up, and half of it is accomplished when he can sit alone. After this he begins to move from place to place by crawling and creeping. Then he is able to pull himself to a standing position, and finally walks independently.

Most children walk by the age of 18 months, but others may be retarded because of such factors as nutrition, body weight, and body build, illness, sensory defects, slippery floors, falls, or poor intelligence.

By the time the child enters school he can walk well, and can run, climb, jump, dance, skip, and hop.

In the development of manipulation the eyes lead and the hands follow, and little progress is achieved until there is eye-hand coordination. Reaching is circuitous and inaccurate at first, but a straight approach usually is achieved by the end of the first year. The hand grasp proceeds from the palm to the fingertips, and by 52 weeks the pincer type of grasp is fairly well developed. Some writers, however, feel that the adult phase of reaching-prehensile behavior is not attained before the fourth or fifth year.

Considerable progress in manual control is made during the pre-school period. The five-year-old can handle a spoon, cup, fork, and knife fairly well and can help to undress and dress himself.

Walking and prehension follow two general laws: (1) the law of cephalocaudal development, from a head to foot direction, and (2) the law of proximodistal development, from the trunk out to the periphery of the body.

Three widely held explanations of handedness have been advanced: (1) the theory of cerebral dominance, (2) the position *in utero*; and (3) the orientation of the early tonic neck reflex. The first two of these are open to serious criticism, and the third, although credible in certain aspects, does not account for cases of mixed dominance.

People cannot be classified sharply either as exclusively right- or left-handed, but show some degree of ambidexterity.

In many cases no ill effects result from changing handedness in children if care is taken in the methods used.

Gross motor abilities show some degree of correlation, but this is not true of certain of the fine motor skills. Since these are relatively independent of each other we should speak of *motor abilities* rather than of *motor ability*.

The four fundamental motor abilities are: (1) speed, (2) accuracy, (3) steadiness, and (4) strength of voluntary movement.

Tests have been devised to measure these four capacities, but their value is limited at the preschool level. Results of these tests show that improvement takes place in all four motor abilities with advancing age, and that the increase in strength is greater than in height or weight.

There is little relationship between intelligence and motor capacities except at the preschool level.

Complex motor skills show rapid improvement with advancing age. This is especially true between the ninth and twelfth years and in later adolescence.

Tests, such as the Brace Scale, are designed to assess these complex motor skills. In general, boys excel girls in activities involving strength, general bodily speed, and endurance, whereas girls are superior to boys in fine hand coordination and body balance.

Tests of motor skills may have little value for vocational guidance, because they are specific to the situation in which they are used. Furthermore, mechanical ability includes other factors which are necessary to success.

To secure maximum motor development, parents and teachers should encourage freedom of movement and should praise achievements with discrimination. If poor posture occurs, it may be corrected by special exercise or massage. Proper alternation of work and rest periods will help to prevent fatigue. Rhythmic movements will promote motor coordination, and a variety of motor adjustments will give exercise to a large number of muscles. In motor learning one's attention should be directed to the goal to be achieved rather than to the movements involved. It is doubtful if breaking a complex skill into its component parts, and practicing these parts separately, aids in the mastery of the skill as a whole.

The development of adequate motor skills is vital to the social adjustment of children and youth. Wise leaders try to provide opportunities wherein all individuals can participate and achieve a feeling of success. If this aspect of socialization is neglected, the individual may become a "wallflower" or "fringer," and this withdrawing tendency may persist into adulthood.

There are other abilities besides motor skills which are necessary for social adjustment, and these will be dealt with later in this book. One of the most important aids to socialization is language, the development of which will be considered in the next chapter.

SUGGESTED ACTIVITIES

1. Observe the development of walking and prehension in one or more babies and identify the stages which they illustrate.
2. Visit a nursery school or a kindergarten and ask for permission to check the motor development of one child, using the California Scale.
3. Construct a manoptoscope in accordance with the directions given by F. L. Goodenough in *Developmental Psychology*, Appleton-Century-Crofts, Inc., New York, 2nd ed., 1945, pp. 305 and 302. Check the eye dominance of some of your friends. Include both left-handed and right-handed individuals, and observe whether or not eye dominance and hand dominance coincide.
4. Report to the class any instances of which you may know where children were changed from left- to right-handedness, and note whether or not any difficulties occurred.
5. If your college has a psychological laboratory, secure permission to observe and try some of the motor tests for adults described in this chapter.
6. Report to the class, withholding names, any cases of which you may know where a lack of motor skill is a major factor in social maladjustment.

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CHAPTER 6

HOW LANGUAGE DEVELOPS

WHY LANGUAGE IS IMPORTANT

Of all our many activities, those involving language are among the most complex and, at the same time, the most characteristically human. There is ample evidence that some form of communication exists among animals, but apparently it is limited to simple and immediate situations. The use of symbols to convey ideas which involve the past and the future, as well as the present, is a distinctly human ability.

It will be recalled that in Chapter 2 we discussed the comparative development of a chimpanzee, Gua, with that of Donald, a human child. Gua could understand 50 different words and could make her wants known by means of special types of barks. The structural limitations of her nervous system, inherent in her species, however, prevented her from acquiring active speech. In some phases of their early growth Gua was superior to Donald, but as soon as the boy achieved facility in language, he left the chimpanzee far behind.¹

Looking back over man's evolutionary history, it can be said that the development of meaningful language marks what is perhaps his greatest achievement. As we shall see later, it is the principal medium for the appraisal of intelligent behavior, and is closely related to thinking. Language also is the chief means for the acquisition and transmission of knowledge, and it is the basis for all the intricate social relationships which exist among human beings.

¹ W. N. and L. A. Kellogg, *The Ape and the Child. A Study of Environmental Influence upon Early Behavior* (Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1933).

It has been customary to divide language into three basic types: (1) vocal, (2) graphic, and (3) gesture. The first is concerned with the communication of ideas through the use of certain speech sounds, as in ordinary conversation. The second includes the transmission of ideas, either in written or in pictorial symbols—for example, in reading and writing, art, and various types of creative expression. The last refers to communication through signs and pantomime, as in the manual alphabet of the deaf, or the grimaces and actions used to supplement vocal speech.

In this chapter we shall deal primarily with the ontogenetic development of vocal speech. It is not our purpose to discuss the theories which have been advanced to account for the origin of language in the race.² Rather, we shall confine our attention to a discussion of the appearance and growth of spoken language in the individual, and its relationship to other phases of development. As we shall see, after language is established it is involved in practically all aspects of human activity, and this activity in turn profoundly influences language. In subsequent chapters we shall consider more specifically some of the phases of graphic language, such as reading and art.

STAGES IN THE DEVELOPMENT OF SPEECH

There is no agreement among scientists as to the beginning of speech because there is no unanimity as to what language is. We have no desire to enter into this controversy but are interested solely in pointing out some general facts which can be interpreted in a practicable way.

One investigator³ maintains that language begins with the birth cry; others claim that the crude beginnings of speech date from the random vocalizations which accompany mass activity in the newborn.⁴ Another careful observer says that the birth cry is simply a reflex, and that real speech does not begin until the babble stage, where she claims there is intent or purpose.⁵ Although the authors

² An interesting account will be found in S. H. Britt, *Social Psychology of Modern Life* (Rinehart and Company, Inc., New York, rev. ed., 1949), pp 139-141.

³ S. Blanton and M. G. Blanton, *Child Guidance* (Appleton-Century-Crofts, Inc., New York, 1935), chap 8.

⁴ F. D. Brooks, *Child Psychology* (Houghton Mifflin Company, Boston, 1937), p. 175; also M. M. Lewis, *Infant Speech*, p. 7.

⁵ J. C. Fenton, *A Practical Psychology of Babyhood* (Houghton Mifflin Company, Boston, 1925), chap 6.

agree that the reflex sounds at birth and during the first few months of life are the raw materials of language, they are of the opinion that babbling, or even word saying, does not comprise real speech. To them speech begins when the child develops meaningful associations between words and objects. In general, this may occur anywhere between 8 or 9 and 18 months, but there are exceptions which will be discussed later.

Although there are marked individual differences in the development of language, and there is much overlapping, it does follow certain broad outlines or sequences. For convenience they may be classified into the following stages: (1) the period of reflex sounds, (2) babbling; (3) word using; (4) the one-word-sentence stage; (5) the stage when words are combined into thought units, and (6) the period when the child is mastering all uninflected speech forms.

THE STAGE OF REFLEX SOUNDS

Reference has been made earlier to the birth cry and its elaborate and often sentimental interpretation by poets and philosophers. Scientists no longer accept these interpretations, and are interested in the birth cry primarily because it is the basic reflex which initiates the production of sound. "When air first strikes the delicate membranes of throat, nose, and lungs, a gasping breath results, which is given back in a cry, as automatically as a burned finger draws back from the fire, or an eye blinks when something approaches it. . . . If the sudden contact with air does not start the reflex cry, the doctor administers a sharp slap or otherwise causes a nervous shock which finds outlet along these nerve paths which set the crying, and hence the breathing, muscles in action."⁶

Actually the neuromuscular mechanisms in making sound are capable of functioning before birth. Crying has been observed in fetuses delivered prematurely as early as the fifth or sixth month.⁷ Many instances of fetal crying, also, have been reported in the literature, and a recent case was described in Chapter 3. It is the birth cry, however, which is usually regarded as the crude beginning of speech.

Nevertheless, there is no one speech organ which is ready to function at birth. True speech results from the coordinated action of the

⁶ *Ibid.*, p. 6.

⁷ L. Carmichael (ed.), *Manual of Child Psychology*, chap. 2 by Carmichael, p. 107, and A. Gesell, *The Embryology of Behavior* (Harper & Brothers, New York, 1945), p. 82.

throat muscles, larynx, and lungs, as well as from the movements of the lips and tongue, and this requires a certain degree of maturity.

Crying is the neonate's first means of expressing himself, and it becomes differentiated after the third week of life.⁸ The child responds to such varied conditions as hunger, pain, cold, intense sounds, restraint, chafing, wetness, and other physiological needs with different types of cries; and the discerning mother soon learns to identify them. For instance, pain cries usually are loud and shrill, often interrupted by whimpering. Mild discomfort may result in low and whimpering cries, and hunger may produce loud wails interrupted by sucking movements. In time the baby learns that crying brings attention and comfort, and it then becomes a means to an end, rather than a direct response to physiological conditions.

In addition to crying, the infant has quite a repertoire of vocalizations, many of which resemble basic speech sounds. Some writers believe that the baby can make all the required sounds for any language, and that these become narrowed down through imitation and social approval to the sounds of the language spoken by people around him. Others maintain that only a very limited number of sounds can be made during infancy, and that these are built up gradually into complex speech patterns through maturation and practice.⁹

In the older studies, based primarily upon baby biographies, it was quite generally agreed that vowel sounds occur before consonants, but there was not complete unanimity as to the order of their appearance. It was thought that *a* or *u* were among the earliest vowels to be uttered, and that the first consonants were *m*, *p*, and *b*, known as labials because they are produced by the lips. These were followed by the dentals, *d* and *t*, made by the teeth, and later by the gutturals or throat sounds, *g* and *k*. Finally, the sibilants (*s* sounds), as *s* and *z*, occurred.¹⁰

More recent research, done with greater precision and standardization of techniques,¹¹ has shown that baby biographers did not

⁸ Quoted from C. Buhler by E. Hurlock, *Child Development* (McGraw-Hill Book Company, Inc., New York, 1942), p. 76.

⁹ Carmichael (ed.), *op. cit.*, chap. 10 by D. McCarthy, p. 493.

¹⁰ Consult M. M. Shirley, *The First Two Years*, Vol. II, *Intellectual Development* (University of Minnesota Press, Minneapolis, 1933), pp. 48-54; W. Stern, *Psychology of Early Childhood*, p. 145; O. C. Irwin, "Research in Speech Sounds for the First Six Months of Life," *Psychological Bulletin*, 1941, 38: 277-285.

¹¹ Lewis, *op. cit.*, and Irwin, *op. cit.*

make their observations early enough, so that the child had achieved considerable progress in the raw materials of speech before records were taken. Furthermore, through the use of more objective recording devices and by means of the International Phonetic Alphabet, some of the sounds which were unintelligible in earlier studies can now be transcribed according to a standard form. Newer electrical devices, such as wire and tape recording, seem to offer promising techniques for future research in the development of oral language and may help to clear up some of the points which are still in dispute.

In a study by Irwin and Chen¹² of 95 infants from middle-class homes, ranging in age from one to 30 months, it was found that the repertoire of the baby during the first two months of life includes 7.5 sounds. By the twenty-ninth and thirtieth months, however, 27 of the 35 sounds present in the speech of adults had appeared.

Other investigations¹³ conducted at the University of Iowa show that the first vowels to occur are those made in the front part of the mouth, whereas those produced in the middle and back of the mouth come later. Examples of front vowels are *a* as in *fat* or *man*, *e* as in *me* or *see*, *i* as in *pin* or *it*. Middle vowels are illustrated by *a* as in *fall* or *talk*, and *u* as in *up* or *but*; and back vowels include *oo* as in *soon* or *room*; *a* as in *paw*; and *o* as in *off* or *song*. Of 1000 vowel sounds recorded for 40 babies during the first 10 days of life, 92 percent were front vowels, 7 percent were middle vowels, and only 1 percent were back vowels. However, the middle and back sounds became more prevalent by the beginning of the second quarter of the first year.

The aspirate, *h*, is the most frequently used consonant and appeared early, but during the first 10 days of life no *m*, *b*, or *p* sounds occurred. Contrary to the vowels, the order of appearance of the consonants is from those formed in the back of the mouth to those articulated in the front.

It has been suggested that back consonants, such as *g* as in *great*

¹² O. C. Irwin and H. P. Chen, "Development of Speech During Infancy: Curve of Phonemic Types," *Journal of Experimental Psychology*, 1946, 36: 431-436.

¹³ O. C. Irwin and T. Curry, "Vowel Elements in the Crying Vocalization of Infants Under Ten Days of Age," *Child Development*, 1941, 12:99-109; also Irwin, "Research on Speech Sounds for the First Six Months of Life," *Psychological Bulletin*, 1941, 38:277-285.

or *go*, and *k* as in *kick* or *kitchen*, are associated with the swallowing and belching movements following feeding. Front consonants as *m* in *mama*, and *p* in *papa*, and *b* in *baby* are made with the tongue and lips, come later, and arise in anticipation of being fed.¹⁴

It should be reiterated that there is no deliberate attempt on the part of the infant to produce sounds at this stage of development. They are called forth merely in response to physiological needs and as accompaniments to general bodily movements.

THE BABBLE STAGE

It is rather difficult to answer the question as to when babbling begins and ends. The limits of this period of speech depend upon one's definition of "babbling," as well as upon the tempo of the baby's development. If we consider babbling as the period beyond the development of reflex sounds, and as the beginning of spontaneous vocal play, then it may start as early as three or four months. In the beginning the baby makes monosyllabic sounds like "da" or "ga" merely for the pleasure he derives from producing and hearing them. At first these tend to be explosive in nature, probably caused by chance activity of the vocal apparatus. Later, cooing and squealing occur in response to feelings of well-being.

This spontaneous production of sounds is followed by their repetition, which is characteristic of *real* babbling. In this situation the sound made and heard by the baby acts as a stimulus to its repetition, and chains of vocalizations, such as "da da da" or "ga ga ga," result. One author¹⁵ explains this reduplication of sound, wherein the child imitates himself, as a circular reflex.

Many adults confuse the circular reflex with the beginning of meaningful speech, which ordinarily does not occur until several months later. It is easy for enthusiastic parents to believe that their child is actually referring to them when he says "da-da" or "ma-ma," when, in reality, he is only indulging in a form of random vocal play. It is true, however, that the first meaningful words spoken by the baby may be "dadda" and "mama," but they are then associated correctly with specific persons. Babbling continues until the end of the first year and sometimes beyond. It often takes on a conversational

¹⁴ Consult Lewis, *op cit.*, chap 3, especially Table I, p. 24.

¹⁵ F. H. Allport, *Social Psychology* (Houghton Mifflin Company, Boston, 1924).

tone because the baby is acquiring variations in pitch and inflection. As illustrated in the case of G. on page 180, parents sometimes become so accustomed to the child's babbling that they fail to distinguish it from real speech.

THE WORD-USING STAGE

The word-using phase of development follows the child's ability to reproduce sounds spontaneously, and to imitate the sounds he has made. When circular reflexes, after repeated practice, are well established, "it is no longer necessary that the child himself should speak the stimulating word. It may be spoken by another. The effect will then be that of the child repeating the sounds which he hears others utter."¹⁶ This imitation of the sounds or words made by others occurs usually around 9 or 10 months and is a forerunner of connecting them with specific situations and objects.

At first the child may develop a "trick vocabulary"; i.e., he may repeat the words used by others as an attention-getting mechanism without any real comprehension of the meaning of speech. Constant repetition, however, plus selection of sounds approved by people in his environment, leads him to the place where he substitutes the spoken word for a specific situation or object, thus completing the transition to *real* speech. For example, when the baby connects its mother with the word "mama," or the word "sit" with the object, chair, then we feel that speech is meaningful. In some children words may be used meaningfully as early as eight or nine months, whereas others are much slower. For the selected group described in the baby biographies the average age was 10 months. The majority, however, reach this period of development between 15 and 18 months.

When children first begin to use language they often employ a generalized term for a specific person or item. For instance, a bus driver, a street cleaner, a store clerk, or, in fact, any man may be called "daddy." Similarly, every dog is a "Fluffy," etc. This is not only an interesting but also, at times, a rather embarrassing stage in so far as adults are concerned.¹⁷

In passing, it should be noted that most children comprehend speech before they use it extensively. This is true even in adult life.

¹⁶ *Ibid.*, p. 183.

¹⁷ Consult Brooks, *op. cit.*, p. 176.

when our reading vocabulary outstrips our spoken vocabulary. One observer¹⁸ noted that at 11 months her niece knew 84 words but actually used only five.

When single words are used in an expletive sense we feel that the child has progressed to the next stage of development.

THE ONE-WORD-SENTENCE STAGE¹⁹

At the fourth phase of development the child is able to express a complete idea, but the sentence structure is incomplete. Some writers refer to these one-word sentences as "sentence words." The ability to inflect a single word (or expletive) to convey a complete idea usually occurs in the majority of children between 13 and 18 months of age. Illustrations of the one-word sentence are: "Kitty!" which may mean "Bring me the kitty!" "Look at the kitty!" "Kitty scratches!" Or "Bang!" meaning "Hear the noise!" or "Watch me while I make a noise!"

THE COMBINATION OF TWO OR MORE WORDS

When the child goes from the one-word-sentence stage to the use of a two- or three-word sentence, distinct progress has been made. These rudimentary sentences usually consist of a noun and verb, but they may include other parts of speech, depending upon the individual's vocabulary and the idea he wishes to express. Surprisingly enough, the child is able to convey quite a variety of meaning with these two- or three-word combinations, as is shown in the following illustrations:

| Two- or Three-Word Sentences | Meaning |
|-------------------------------|--|
| Baby sleep. | Baby wants to sleep. |
| Wead moom. (Read moon.) | Read the nursery rhyme, "The cow jumped over the moon." |
| I down. | I want to get down off the divan. |
| Gampaw walk. (Grandpa, walk.) | Take me for a walk, grandpa. |
| I muk. (milk) | I want milk. |
| Honey, I boots. | Honey, I want the boots. |
| I shoot sparrolol. | I shall shoot some sparrows. |
| No bed. | I do not want to go to bed. |
| No wead. (No read.) | Do not read. |
| No, I doot. | Please don't. I want to do it. |

¹⁸ M. W. Shinn, *The Biography of a Baby* (Houghton Mifflin Company, Boston, 1900), pp. 235-237.

¹⁹ Nouns constitute roughly from 50 to 60 percent of the speech of two-year-olds, but the percentage decreases during the next stage

Scientific investigations generally have concluded that children under four years of age made little use of compound and complex sentences. However, they have failed to point out fully the primitive types of antecedents of these forms used by two- and three-year-olds. An illuminating contribution on this aspect of language development has been made by members of the staff of the Bank Street School in New York City. Informal, longitudinal records over a period of six years have been kept of the expressions used by about 17 children two and three years of age. These have been carefully analyzed and have revealed some interesting data on the growth of thinking and speech in the nursery school child.²⁰ There is ample evidence to support the conclusion that children can think and even express, though crudely, the relations of cause, purpose, result, and condition before they can employ complex sentence structure. The following are illustrations²¹ of these "pre-forms," as Woodcock has called them.

- I. *Causal* thinking before the appearance of the word *because*
 - a. Girl (2 years, 8 months)—"Janet don't need a coat on. Janet's too warm a coat." [This means Janet doesn't need to wear her coat because she is too warm.]
 - b. "Don't sit on 'at wadiator—very hot." [Don't sit on that radiator because it is very hot.]
- II. The use of the connective "and" for "so that" to express *result*
 - a. "Gate all c'ose and mummy can't get out." [The gate is closed so that mamma cannot get out.]
- III. Expressing the concept of *purpose* before the appearance of the words "so that"
 - a. "C'ose a door—nobody come in " [Close the door so that no one can come in.]
- IV. A child wanting to know the *reason* for something before she can use the word "why"
 - a. Girl (at 2 years)—"Covers? Covers?—Door? Do-or?" (with an upward inflection). [The child wanted to know why her doll covers were wedged between the folding doors while she was asleep. The wind had caused the doors to rattle.]
 - b. Same girl (2 years, 6 months)—"What for Lois cwyng? Wha' she cwyng for?" [Why is Lois crying? Why is she crying?]
 - c. Same girl (2 years, 10 months)—"Woof?" (roof—with upward inflection) "Wain?" (rain—with upward inflection) "Tassi?" (taxi)

²⁰ Read *When Children First Say: Why-Because-If* by L. P. Woodcock (69 Bank Street Publications, New York, n.d.).

²¹ Reproduced by permission of the author and the 69 Bank Street Publications

—with upward inflection). [The teacher put the child's coat on her because the room was cold. The child wondered if she were going to play on the roof, whether it was raining, or whether she was going home in a taxi.]

V. The idea of *if* (to express *condition*) with the word omitted. This is illustrated by jumping from one clause to another with or without an intervening breath.

a. "Mama doing spank me I det out my bed anight." [Mama is going to spank me if I get out of bed at night.]

Other characteristics of this period are the child's desire for rhythm and cadence,²² as "up-a-go, down-a-go"; "bumpity-bump, bumpity-bump"; "yum yum"; and his love for the repetition of sounds, as "Bebe home. Jean home. Daddy home." The small child, also, likes to repeat new words over and over, as in the case of G—adding the word "everything" to each sentence.

Adults may be quite helpful to young children in their language development by observing a few basic principles. They should serve as models of good speech by enunciating words clearly and pronouncing them correctly. They should avoid slurring over connectives, and should not substitute phrases for complete sentences.

Since the child needs time to connect sound with thought, parents should speak slowly and should not try to give too many ideas or commands at once. They should address the child directly and should allow him ample time in which to express himself. The child should not be "talked down" to, nor should anything be done which would add to his self-consciousness, such as asking him to repeat "cute" sayings for the amusement of others.

The foregoing stages in speech development may be clarified and amplified further by the following illustrative case of G.

ILLUSTRATIVE CASE OF THE EARLY LANGUAGE DEVELOPMENT OF G. B.

4 months: He responds to language. He can tell pretty well what direction sounds come from, especially talking. He is more and more active and squeals a lot now instead of crying.

8 months: He makes a great variety of sounds. It certainly seems as if he's talking when jabbering to himself.

9 months: He waves bye-bye on occasion. He also makes an attempt to

²² Woodcock, "We Begin to Talk." Reprint from *National Parent-Teacher Magazine* and sold by 69 Bank Street Publications, New York.

say bye-bye. When we say: Do you want to go bye-bye? he replies, *ba-ba*. He also says *da-de* and "talks" to himself when he plays.

11 months. G throws things on the floor and says *bang!*

12 months: He says *bye-o* when he rocks.

13 months. G can say *light* and says *yum-yum* when asked if he wants his orange juice. *Up* accompanied by a pull on the mother's skirts or the father's trousers indicates he wants to be held, and *down* when he wishes to be placed on the floor.

14 months. Associates the meaning of *bow-wow* with dog and *ball* with the object; also *mama*, *daddy*, *tick-tock*, and *ding-dong*

15 months. When riding in his buggy he says *hi* to everyone he meets.

16 months: When asked how the doggie goes, he says *woof-woof* rather than *bow-wow*. He says *boo* for please and makes an effort to say *thank you*. He gets the inflection but not the correct sound. *No-no* is a popular expression and attempts are made to say *water* and *bottle*

17 months: He says *bee* or *beau* for please, instead of *boo*. He also uses *ga-ga* for water and *ca-ca* for cracker. G. ends all his conversations over his toy telephone with *ga-bye*. When given a doll he exclaimed: *Oh! be-be* and loved it. In pulling things around he yells *toot toot*. When visiting at a friend's home he saw the lights on their Christmas tree and exclaimed: *Oh Dee!* Since that time he says it for everything that pleases him.

18 months. G.'s gabbling is becoming intelligible. He says, *Where is it? Where, Daddy? There it is*. He likes pictures of babies and really says *baby*. He tries so hard to say things and very often we fail to hear what he says because we are so accustomed to his "gabbling." When watching the snow he said *wa-wa*, but when told it was *snow* he said *mo* with a snuffle in front of it, and wrinkled up his nose. A railroad engineer let G. inspect his engine and told him to come to see him again, to which G. replied *all right* and *good-bye*. He has a new word, *more*, which he likes, and does he use it! When told that the little neighbor girl had gone bye-bye, he said: *cool?* (school). When putting on his socks I tell him about the little pigs and I let him finish it when it comes to "the little pig cried." In making shadow pictures for him during his sun bath we say, *quack, quack*. Now, every time he sees his shadow he wiggles his hand and quacks.

19 months. He tries to say everything you ask him to and understands quite complicated directions. He asks for paper now when he wants to write and calls writing *ree-wee*. He tries to say *Humpty Dumpty* and *Little Boy Blue* when he sees them in his book. If he is looking for the book he says, *Umting Dumting—where is it?* Whenever he hears a wagon go by he gets up on the couch so he can see and says. 'orsies *Skippy* is *Pfippy* to him, but that is so hard to say, so he just uses *woo-woo*.

20 months: He says so many things now. Sometimes he'll repeat something we say and surprise us because we don't think he's listening. He says *houf* for *house*, *meat mar* for *meat market*, and *rarrit* for *rabbit*. In greeting Beverly he says, *Hi, Bebe*. He tries to say sentences now, as, *kitty gone home*. When I ask him what the piggy says, he replies, *wee, wee, home*. When he wants to get down, he says, *I down*. *Screws* are *crews*, and *tacks* are *tacts*.

21 months. This is what he sang today:

*Bye baby bunting
Dadding untng rarrits*

He says, *Bebe home*. *Jean home*. *Daddy home*. He is getting the idea of mine and says *mine hat*. He says, *I muk* for *I want milk*. I have a list of 209 expressions. Most of them are nouns, but there are some verbs and noun-verb sentences. He wants to talk over the telephone and says, *I talk*—*Bebe*. He wanted his boots when his father was washing the porch and yelled, *Honey, I boots*. He is a great imitator. He gets the gun and says, *I shoot sparrolol*, and then holds up his gun and says *bang!*

22 months: Has added thirty new words since his last list. He uses adjectives, as *big car*. When he hits his head he says, *I bang head*. I swatted a moth this morning and G. was delighted. He yelled, *I got him. I got him*. He picked it up and ran, saying *smoking stand*, where he deposited it.

23 months. He is becoming very independent and *No, I doot* is a favorite expression. He tells me where he has been if he goes for a walk. For example: *I throw sticks in river*. This is about the longest sentence he has made. The whistle on the water tank blows at nine every night and is the signal for G. to be in bed. The other night we were calling, and it started to get dark. G. said, *Whistle blow, ride home in car*. He looked worried and kept insisting until we left.

25 months: G. calls gum drops *gum gops*. One of his favorite rhymes is from his Parade Book.

Oh me, oh my, oh dear!
The animals had a parade
I hear.

Sometimes I have difficulty in making it out. The other day he yelled to the maid: *Do you know I got new bedroom slippers?*

26 months: He strings several sentences together with *and*. His sentences are longer, too. *Where is my Daddy? My Daddy at school teaching children. Mama, what are you doing? Writing letters?*

27 months: When called a little worm for wiggling when I put on his wraps, G. said: *I no worm. Worms outside. Birds eat them.*

31 months. This is a typical sentence. *I guess I'll go back and see what baby sister is doing.* He adds *everything* to each sentence now.

THE MASTERY OF COMPLEX UNINFLECTED SPEECH FORMS

The most advanced stage in the growth of language probably begins in children around the age of three and continues to mental maturity and beyond. The progress of the individual is dependent upon (a) the growth and extension of vocabulary and (b) the use of various grammatical constructions.

Growth of Vocabulary

The term "vocabulary" has been used in many different ways and with a wide variety of meaning.²³ Sometimes it refers to the number of words used spontaneously in conversation or in writing. At other times it is employed to describe the ability to define words or to use them in sentences to illustrate meaning. Again, it may refer to the recognition of words in reading, even though the word cannot be defined. There has been great variability, also, in the techniques used to study the growth of vocabulary. The older studies made extensive use of the biographical method, wherein the spontaneous expressions either of a single child or of a small number of children were recorded by a parent or relative as they occurred. Notes were taken in a more or less systematic way by some parents, while others jotted them down according to their whims or fancies. Some compiled an alphabetical list of words used by the child; others underscored such words in a dictionary. In some instances derivatives of words were included, whereas in others they were not. With the introduction of more scientific techniques, some investigators recorded samplings of words used spontaneously during play or running conversations occurring in home situations. Others used analyses of words or parts of speech employed in written compositions, while still others administered vocabulary tests based upon the sampling of words taken from abridged, later from unabridged, dictionaries.

Because of this great variability both in the meaning attached to the term "vocabulary" and in the methods employed in studying it, some writers feel that any tabular list showing its growth is highly

²³ Consult McCarthy, in Carmichael (ed.), *op. cit.*, pp. 504-512; M. K. Smith, "Measurement of the Size of General English Vocabulary Through the Elementary Grades and High School," *Genetic Psychology Monographs*, 1941, 24:311-345, and J. J. B. Morgan, *Child Psychology* (Rinehart and Company, Inc., New York, 3rd ed., 1942), chap. 9.

inaccurate, and that comparison of the results of these different studies is impossible.²⁴

Despite these difficulties, we shall present data from several typical studies showing the approximate growth of vocabulary at various age and grade levels. From these summaries it will be seen that the ability to use words increases relatively slowly during early childhood and then more rapidly in later childhood and adolescence. It will be noted, also, that *recognition* vocabulary greatly exceeds *use* vocabulary. That is, both child and adult recognize many more words than they can define or use accurately. In addition, the more recent studies, based upon word samplings taken from unabridged dictionaries, show that vocabularies at different stages of maturity are much larger than was indicated in the older investigations. It has been shown by actual count that Shakespeare used about 15,000 different words, Milton 11,000, and Victor Hugo 20,000. However, we do not know how many words were considered in making final selections, or the actual recognition vocabularies of these men.²⁵

INCREASE IN SIZE OF VOCABULARY DURING THE PRESCHOOL YEARS²⁶

| Year | Months | Number of Cases | Number of Words (use) | Gain |
|------|--------|--------------------|--------------------------|------|
| | 8 | 13 | 0 | |
| | 10 | 17 | 1 | 1 |
| 1 | 0 | 52 | 3 | 2 |
| 1 | 3 | 19 | 19 | 16 |
| 1 | 6 | 14 | 22 | 3 |
| 1 | 9 | 14 | 118 | 96 |
| 2 | 0 | 25 | 272 | 154 |
| 2 | 6 | 14 | 446 | 174 |
| 3 | 0 | 20 | 896 | 450 |
| 3 | 6 | 26 | 1222 | 326 |
| 4 | 0 | 26 | 1540 | 318 |
| 4 | 6 | 32 | 1870 | 330 |
| 5 | 0 | 20 | 2072 | 202 |
| 5 | 6 | 27 | 2289 | 217 |
| 6 | 0 | 9 | 2562 | 273 |

²⁴ Carmichael (ed.), *op cit.*, chap 10, especially Table 4, pp. 520-521.

²⁵ G. W. Hartmann, "A Critique of the Common Method of Estimating Vocabulary Size, Together with Some Data on the Absolute Word Knowledge of Educated Adults," *Journal of Educational Psychology*, 1941, 32:351-354; consult especially p. 352.

²⁶ From M. E. Smith, "An Investigation of the Development of the Sentence and the Extent of Vocabulary in Young Children," *University of Iowa Studies in Child Welfare*, 1926, 3. No. 5. (By permission of Iowa Child Welfare Research Station, State University of Iowa, Iowa City.)

COMPARISON OF OLDER AND MORE RECENT STUDIES
ON USE AND RECOGNITION VOCABULARIES²⁷

| Grade | Use | Recognition | |
|-------|--------------------------------|-----------------------|------------------------|
| | (C. C. Branden- burg, 1918) | (N. B. Cuff, 1930) | (M. K. Smith, 1941) |
| 1 | | | 16,900 (basic) |
| 2 | 4,000 | | |
| 3 | 5,429 | 7,425 | |
| 4 | 6,887 | 10,395 | |
| 5 | 8,207 | 12,460 | |
| 6 | 9,613 | 13,955 | |
| 7 | 11,445 | 14,910 | |
| 8 | 12,819 | 16,800 | |
| 9 | 13,504 | 19,160 | |
| 10 | 15,340 | 20,930 | |
| 11 | 13,974 | 21,245 | |
| 12 | 14,975 | 21,840 | 47,300 (basic) |

| Age | Use | Recognition | |
|------------------------|---------------------------------------|---------------------------------------|--|
| | (L. M. Terman, 1916) ²⁸ | (F. L. Mandel, 1947) ²⁹ | (M. J. Schulman and R. J. Havigh- hurst, 1947) ³⁰ |
| 4 | | 5,600 (basic) | |
| 5 | | 9,600 | |
| 6 | | 14,700 | |
| 7 | | 21,200 | |
| 8 | 3,600 | 26,300 | |
| 9 | | 29,300 | 38,900 |
| 10 | 5,400 | 34,300 | 41,400 |
| 12 | 7,200 | | |
| 14 | 9,000 | | |
| 16 (average adult) | 11,700 | | |
| 18 (superior adult) | 13,500 | | |

²⁷ Reproduced from a summary table on pp. 26 and 27 of "The Measurement of Individual Differences in General English Vocabularies," by R. H. Seashore and L. D. Eckerson, *Journal of Educational Psychology*, 1940, 31:14-38.

²⁸ From L. M. Terman, *The Measurement of Intelligence* (Houghton Mifflin Company, Boston, 1916), p. 226.

²⁹ From a report sent by Northwestern University News Service to *School and Society*, 1947, 66:163-164.

³⁰ M. J. Schulman and R. J. Havighurst, "Relations Between Ability and Social Status in a Mid-western Community, IV: Size of Vocabulary," *Journal of Educational Psychology*, 1947, 38:437-442.

ADULT RECOGNITION VOCABULARY³¹

| | (R. H. Seashore) ³² 1933 Basic Words | (G. W. Hartmann) ³³ 1946 Basic Words and Derivatives |
|------------------------------------|---|--|
| Freshman | | 188,320 |
| Sophomore | 65,000 | 202,800 |
| Junior | | 230,000 |
| Senior | | 238,960 |
| Average college undergraduate | | 214,880 |
| Average normal- school graduate | | 259,430 (1941 study) |
| Average adult | 65,000 | |
| Superior adult | 80,000 | |

The quality of the child's vocabulary also shows development and maturity with increasing age. Around five years he usually defines words in terms of use,³⁴ as, for example, "a chair is to sit on"; at seven, he may be able to differentiate two things, such as the difference between glass and stone.³⁵ He may say: "You can see through glass, but you can't see through stone." Later (around eight years), he recognizes how things are similar. For example, "Wood and coal both burn."³⁶ At about this time he classifies³⁷ a word when defining it, instead of giving its use exclusively. Now "chair" is "a *thing* you sit on," etc. Around 12 years of age and beyond he shows increasing ability to define abstract words, such as "charity."³⁸ As he matures further, social or moral concepts may color his definitions.

Although there are wide individual differences in loquacity, M. E. Smith found that during free play there was a steady increase from

³¹ In 1940 Seashore and Eckerson estimated the *use* vocabulary of the average college undergraduate to be 153,202 words and the *recognition* vocabulary 155,736.

³² Seashore, "The Measurement and Analysis of Extent of Vocabulary," *Psychological Bulletin*, 1933, 30:709-710.

³³ Hartmann, "Further Evidence of the Unexpected Large Size of Recognition Vocabularies Among College Students," *Journal of Educational Psychology*, 1946, 37:436-439.

³⁴ Terman, *op cit.*, p. 167.

³⁵ *Ibid.*, p. 199.

³⁶ *Ibid.*, pp. 217-221.

³⁷ *Ibid.*, pp. 221-224.

³⁸ *Ibid.*, pp. 281-284.

an average of 78 words per hour for two-year-olds to 400 words per hour for four-year-olds. After that time, however, there was practically no change.³⁹

With increasing maturity, also, the child's language becomes more intelligible. At 18 months about one-quarter of his vocalizations are understood, whereas at two years two-thirds can be comprehended, growing to nine-tenths at three years and practically all by four years.⁴⁰

Grammatical Constructions

From the simple one-word sentence (nouns), the child advances to the two-word sentence consisting of a noun and verb. Then come qualifying adjectives, adverbs, prepositions, and conjunctions with a decrease in nouns and a corresponding increase in difficulty of sentence structure.⁴¹ After the child can use the conventional parts of speech, so many factors enter into the situation that they are no longer significant developmentally.

A study made in 1925 shows that by three and a half years the child is using complete sentences averaging about four words with only one or two out of 50 being classifiable as compound or complex. Few omissions are made in sentences after three years of age, and most four-year-olds can use complete sentences of from six to eight words.⁴² Although this investigation was made on only a few children, its results have been fairly well confirmed by more recent studies including larger numbers of subjects extending through nine and a half years of age.⁴³

Functionally complete but structurally incomplete sentences decrease with maturity but still may comprise as much as one-third of the speech of children nine and a half years old. Compound and complex sentences seldom occur in the speech of the two-year-old,

³⁹ M. E. Smith, *op. cit.*

⁴⁰ McCarthy, *The Language Development of the Preschool Child*, p. 51. See, also, her article in R. G. Barker, J. S. Kounin, and H. F. Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 7, especially Table 2, p. 116.

⁴¹ For a clear and interesting account read M. M. Nice, "Length of Sentences as a Criterion of a Child's Progress in Speech," *Journal of Educational Psychology*, 1925, 16 370-379. See also M. S. Fisher, *Language Patterns of Preschool Children*.

⁴² Nice, *op. cit.*

⁴³ See Carmichael (ed.), *op. cit.*, chap. 10 by McCarthy. Note especially Table 4, pp. 520-521.

and constitute only about 6 to 7 percent of the understandable sentences at three and a half and four and a half years. Interestingly enough, they tend to remain at this level for the nine-and-a-half-year age group. Compound-complex sentences are rarely found among preschool children, but when they do occur, the maximum of 6 percent is reached at four and a half years. By nine and a half years this proportion has increased to 10 percent.⁴⁴

In her studies McCarthy showed that incomplete sentences decreased from 25 percent at two years to 8 percent at four and a half years. Another investigator found about 15 to 16 percent of incomplete sentences at the nine-and-a-half-year level. After listening to the conversation of adolescents and adults, one wonders if the proportion of incomplete sentences is not equally great among them!

The length of sentences in general is an index of maturity in language development. At the age of two years about 37 percent of children use sentences. This increases to 68 percent at three years, 84 percent at four years, and 87 percent at five years.⁴⁵ By the time a child enters school, he has mastered the speech forms used in ordinary conversation. Many years elapse, however, before he understands their grammatical structure.

Children around 10 and 11 years of age use longer and more complex sentences than do seven- and eight-year-olds. At about the fourth- and fifth-grade level children who speak well also write well. Dependent clauses increase in frequency with maturity, and there is also an increase in complexity and clarity of thought: "The average length of the clause is comparatively constant between the ages of 8 and 16,"⁴⁶ and the proportion of infinitives to subordinate predicates decreases as maturity increases. A recent study shows that the position of the clause within the sentence, also, has developmental significance. Generally speaking, older and brighter children use clauses at the beginning of sentences.

WHY SOME CHILDREN ARE SLOW IN TALKING

Very often normal children fail to talk at the usual age or may begin talking at the time which is common to most children and then

⁴⁴ *Ibid*, Table 6, p. 525

⁴⁵ F. B. Sherbon, *The Child. His Origin, Development and Care* (McGraw-Hill Book Company, Inc., New York, 2nd ed., 1934)

⁴⁶ L. L. La Brant, "A Study of Certain Language Developments in Children in Grades Four to Twelve Inclusive," *Genetic Psychology Monographs*, 1933, 14:387-491.

undergo a period of stagnation. One investigator presents evidence showing that vocal play or babbling may decrease while a motor skill, such as sitting up, is being developed.⁴⁷ Other studies show that children who excel in motor development may be slower in talking. There are data, also, which indicate that talkative nursery school children are more active than others.⁴⁸

Imperfect hearing or vision, defective speech organs, mental retardation, the development of a new motor skill, or a birth injury affecting the speech areas in the brain may explain a child's slowness in learning language. If every need of a child is anticipated, so that the development of speech is unnecessary in securing his wants, there will be no incentive for learning language.

WHAT ARE THE LANGUAGE DIFFICULTIES OF PRESCHOOL CHILDREN?

Among the difficulties experienced by preschool children we may mention the following:⁴⁹ (1) the omission of an essential word or words—the most common error; for example, “I not a bird. I tiny little baby”; (2) the omission of the copula, as, “I going” for “I am going”; (3) errors in the use of a verb: “He brang eggs and bunnies”; “The Easter bunny leaved some baskets”; (4) incorrect use of auxiliary and tense: “I have went”; “I done it”; (5) wrong number and case of pronouns: “It was him”; (6) omission of the article, as “the, a, an”, (7) lack of agreement between subject and verb, as, “He, she, or it don't work”; (8) omissions of or wrong prepositions, as, “I'm surprised to you”; “I went at the library with mama.” However, “by the time the child is six years old, most of his errors in speech have been eliminated except such as he commonly hears spoken by his elders.”

Other difficulties confront the child and are noticed by observant adults. The young child tends to form tenses and plurals regularly. For example, he gives *foots* as the plural for “foot” and may use *frowed* for the past tense of “throw.”⁵⁰ There is also a tendency for

⁴⁷ Shirley, *op. cit.*, pp. 69–71.

⁴⁸ J. E. Anderson, “The Development of Spoken Language,” in G. M. Whipple (ed.), *Child Development and the Curriculum* (Public School Publishing Company, Bloomington, Ill., 1939), Part I, p. 219.

⁴⁹ M. E. Smith, “Grammatical Errors in the Speech of Preschool Children,” *Child Development*, 1933, 4:183–190.

⁵⁰ J. Drever and M. Drummond, *The Psychology of the Preschool Child* (P. S. King and Son, Ltd., London, 1929), p. 161.

him to coin words,⁵¹ such as *cigaretting* for smoking cigarettes, *glorious* for "gorgeous," and *breakolate*, a combination of "breakfast" and "chocolate."

Onomatopoeia, or imitating the sound of an object or animal for its name, may be used, as *bow-wow* for "dog," *meow* for "cat," *moo-moo* for "cow," etc. One mother observes that her son used *bow-wow* for "dog" at 15 months of age, but by 20 months he was employing the word *dog*.⁵²

Words are often mutilated by omitting sounds or even entire syllables,⁵³ as *ittle* for "little" and *emergence* for "emergency." One sound may be substituted for another, as *dood* for "good"; *toffee* for "coffee"; *gugar* for "sugar," etc. Sounds also may be transposed, as *evnelope* for "envelope," *waps* for "wasp," *kitchne* for "kitchen," *chickne* for "chicken," and *engery* for "energy."

These mutilations are characteristic of baby talk, which sometimes is encouraged by parents who think it is "cute." Its persistence, however, may interfere seriously with the child's normal speech development and may even retard him in his school progress. In one family, the oldest child repeated the first grade, and the second child was handicapped by unintelligible "baby talk" which had been encouraged by the father. After parental coöperation was secured, the third child used no "baby talk" whatsoever, spoke distinctly, and made normal progress.

The following letters, dictated by a girl of three and a half years, show how spontaneous language may become at this age. However, some of the typical language difficulties which we have mentioned are quite obvious.

The Easter bunny come to see me. He brang eggs and bunnies. He hid the eggs in the kitchen and in the wastebasket and in the daddy-port. The Easter bunny doesn't like folks to come out and see him. He says, "I'm surprised to you. You go back to bed."

The Easter bunny leaved some baskets over to Armstrong's for me. And over to Aunty Welches.

We have new Easter clothes and I went to Sunday school and cut a page out. And that one little boy cut a page out of his good Easter thing and I almost took his scissors away from him.

⁵¹ *Ibid.*; also Stern, *op. cit.*, p. 155.

⁵² Fenton, *op. cit.*, chap. 6.

⁵³ Stern, *op. cit.*, p. 155.

I like the pictures that you cut out for me, Grandpa. I am occited about your being such a great cutter.

Love with,
Dee Dee

Dear Grandpa.

And some time I will take my scissors over to your house and cut some Mickey Mouse pages, dear Grandpa

We have been so naughty that we can't come over today. We got ev-erything over on the floor from the icebox and ate ice and pineapple while mama telephoned. Buzzer wet his pants and I broke a button off my good dress. Mama made me sit in my high chair. Might you be ashamed of that?

I went at the library with mama. I set down and read a book about two little children. I sat down and read a book.

I have flat feet. I won't tell you about picking my nose. We'll just secret you about that.

Our tuwips and our bubs are coming up. The flowers are coming up. I hope old Jack Frost isn't there so he won't bite them.

In love,
Dee Dee

WHAT ARE THE LANGUAGE DIFFICULTIES OF OLDER CHILDREN?⁵⁴

After the child enters school, errors in articulation may still persist, but as he progresses through the grades this type of difficulty tends to diminish. The incorrect use of words and errors in grammatical structure, however, continue throughout the school years and into adulthood. Surveys show that the primary difficulties in English usage are concerned with: (1) weaknesses in the use of verbs, (2) syntactical redundancy, (3) improper uses of pronouns, and (4) the double negative.

Among the errors involved in the first classification are: lack of agreement between subject and verb, as, "We was there"; confusion of past and present tenses, as, "He come in"; and the interchanging of past tense and past participle, as, "I taken the dog out," "I should have came," and "I have saw him."

⁵⁴ Consult D. V. Smith, "Diagnosis of Difficulties in English," in G. M. Whipple (ed.), *Educational Diagnosis*, chap. 13; also H. B. Reed, *Psychology of Elementary School Subjects* (Ginn and Company, Boston, rev. ed., 1938), chaps. 8, 9, 10, and 11.

In the second category we find such errors as "Close up the window," "Mary, she came."

The third type of difficulty is illustrated by "He made it hisself," "Come with John and I."

Examples of the fourth classification are: "You can't never tell," "I can't hardly do it," "He didn't have no money."

The numerous studies made on language usage reveal that a few basic errors repeated over and over account for most language difficulties. For example, a survey in Madison, Wisconsin, from the kindergarten through the sixth grade showed that four items were responsible for more than half the total number of errors. These were: (1) use of the double subject, (2) use of ain't or hain't, (3) confusion of saw and seen, and (4) use of the double negative. It has been suggested by Charters that the correct use of 14 common verbs would eliminate 60 percent of all the oral errors made in his study.

The fact that but slight improvement in grammatical usage is shown from grade to grade indicates that the school has had little success in its attempts to cultivate good English. It must not be forgotten, however, that the child mirrors the language spoken in his home and community, and that his language habits are fairly well established by the time he is old enough to go to school. In some instances the home and community are hostile to what they consider "highbrow" English, and the few hours a day which the child spends in school cannot overcome this influence entirely. If the child is to make any progress in English usage under such conditions, he must be led to realize that there is a difference between the kind of language spoken at home and that used in school, and that as he matures he must adjust his language to the people with whom he comes in contact. The school can be of greater help, also, by concentrating upon the correction of the few specific errors made by individuals rather than upon a general treatment of all types of errors.

STUTTERING AND STAMMERING⁵⁵

In addition to the errors of articulation and language structure discussed in the preceding sections, there are more serious speech difficulties occurring among children and adolescents. Chief among these are stuttering and stammering. Although some writers make no

⁵⁵ For a clear, concise account of the theories of stuttering and stammering read R. M. Dorcus and G. W. Shaffer, *Textbook of Abnormal Psychology* (The Williams and Wilkins Company, Baltimore, 1945), pp. 83-102.

distinction between these terms, stuttering is often used to describe a repetition of sounds, words, or phrases. Stammering, on the other hand, refers to the inability to produce speech sounds at will—a type of emotional blocking.

Stuttering and stammering occur in about 1 percent of school children and are more common among them than among adults. There are three critical periods in development where these types of speech difficulties are most likely to appear: (1) at the time when meaningful speech first develops, (2) between five and seven years, and (3) during adolescence.⁵⁶ However, the early symptoms of stuttering usually appear during the first decade, and rarely after physical maturity has been attained. They are probably most prevalent during the preschool period, about 85 percent of the cases beginning before six years of age.⁵⁷

It is interesting to note that persons who stutter or stammer during oral reading or in conversation may not do so when singing or in public speaking.

Many explanations have been offered to account for stuttering and stammering. It has been suggested that heredity is an important predisposing factor, and instances have been cited of families in which every member stutters. However, it would have to be determined whether or not the stuttering is due to similar stock or to similar environmental influences. Nervous and emotional tension and certain types of motor involvements usually are associated with stuttering, as are also the individual's health and physical condition.

In Chapter 5 we discussed the common belief that changing handedness may cause speech disturbances, and concluded that very few cases can be traced directly to this cause. Occasionally, if a child finds it unusually difficult to change from his left to his right hand, forcing him to do so may produce emotional upset, resulting in stammering. In general, however, a change in handedness need not have this effect.

It is claimed, also, that trying to speak several languages before one is learned thoroughly may cause the individual to stutter.⁵⁸

No distinctive type of personality is characteristic of stutterers or

⁵⁶ J. F. Bender, "Do You Know Someone Who Stutters?" *Scientific Monthly*, 1944, 49:221-225

⁵⁷ W. Johnson, "Stuttering in the Preschool Child," *Child Welfare Pamphlets*, No. 37 (The Iowa Child Welfare Research Station, Iowa City, Iowa)

⁵⁸ E. L. Travis, "Diagnosis in Speech," in G. M. Whipple (ed.), *Educational Diagnosis*, chap. 19, especially p. 417.

stammerers. It has been shown that as a group they are of normal intelligence or better, and few are feeble-minded. Statistics also reveal that stuttering is more prevalent among college and university students than it is among non-college and non-university individuals.⁵⁹

Unfortunately, it often happens that certain facial spasms accompany speech defects. Examples of these are: blowing of the cheeks, protruding of the mouth, blinking of the eyes, and wrinkling of the forehead. Some of these spasmodic movements also are associated with sounds such as blowing, snorting, and throaty noises.⁶⁰ Varying degrees of emotional and social maladjustment have been observed in the majority of stutterers.⁶¹ Fears, anxieties, and sadistic tendencies are prominent even in young children, and often are aggravated by persistent scolding or nagging from parents and teachers.

Obviously, speech defects and the peculiarities of behavior which accompany them are a serious handicap in social adjustment. This is particularly true of the child in school, where, as one speech teacher says: "He is the pupil in the rear of the room who always answers, 'I don't know,' or just stares at you. He is the one nicknamed Dutch or, if he lisps, Rosy. He is the butt of the school jokes and the object of mimicry. Usually, before his school experience is over, he has become either silent and morose, or openly rebellious. He either lives in a futile world of day dreams or asserts himself in some anti-social manner."⁶² This constant humiliation and frustration add to the nervous and emotional tension already present in the individual with defective speech and thus intensify his difficulty. Even though stuttering is outgrown in 30 to 40 percent of cases,⁶³ its effects upon personality may be permanent.

A representative survey of speech defects among school children⁶⁴ shows that roughly their greatest incidence for both whites and Negroes is in the first three grades. Thereafter, there is a steady but irregular decline, as is evident in the tabulation on the next page.

⁵⁹ Bender, *op. cit.*, p. 223.

⁶⁰ J. L. Despert, "Psychosomatic Study of Fifty Stuttering Children," *American Journal of Orthopsychiatry*, 1946, 16:100-113, especially p. 106.

⁶¹ *Ibid.*

⁶² Reprinted from V. D. Meeks, "The Forgotten Child," *West Virginia School Journal*, November, 1940, p. 11.

⁶³ Johnson, *op. cit.*

⁶⁴ F. M. Davis, "Speech Correction in Kanawha County Schools," *West Virginia School Journal*, 1946, 75:11.

| Grade | White | Negro |
|----------|-------|-------|
| First | 228 | 26 |
| Second | 131 | 21 |
| Third | 101 | 32 |
| Fourth | 79 | 30 |
| Fifth | 75 | 32 |
| Sixth | 71 | 21 |
| Seventh | 8 | 5 |
| Eighth | 13 | 4 |
| Ninth | 12 | 2 |
| Tenth | 6 | 4 |
| Eleventh | 7 | 3 |
| Twelfth | 1 | — |

We do not know, of course, how many pupils with speech defects dropped out of school as the upper grades were approached, or the degree to which the existence of speech difficulties may have been a factor in such withdrawals.

Of the 927 pupils in this study who were enrolled for speech correction, 20.92 percent were dismissed with normal speech. The most frequent defect among both whites and Negroes was substitution of letter sounds, being 79.65 percent for the whites and 77.22 percent for the Negroes. Stuttering was the second most prevalent defect, constituting 15.52 percent for the whites and 28.88 percent for the Negroes.

This survey also supports the generally accepted conclusion that speech difficulties are more common among boys than among girls for both whites and Negroes. The percentage for white boys was 68.27, for Negro boys, 54.44; for white girls the percentage was 31.72 and for Negro girls 44.44. When the figures for whites and Negroes are combined, 65.58 percent of the speech defectives are boys and only 34.41 percent are girls.

Although the correction of speech defects is a highly technical process requiring expert knowledge, there are many ways in which parents and teachers can help to overcome these difficulties or to prevent them from occurring. Adults should serve as good models, not only of speech, but also of emotional control and freedom from neurotic symptoms. They should react objectively to the child with a speech handicap and should not label him as a "defective." They should make the child feel at ease and should not hurry him when he is slow in expressing himself. In school he should be encouraged to

volunteer and should be asked questions requiring short answers. He should be given ample opportunity to be successful before other children who may be inclined to ridicule him. In short, an atmosphere freed from tension, opportunities for success, and sympathetic understanding will go far to help the individual with a speech handicap.⁶⁵

WHAT OTHER FACTORS INFLUENCE SPEECH?

There are other factors besides those already mentioned which, singly or in combination, may affect the development of language. Some of these are: (1) sex differences, (2) differences resulting from multiple births, (3) bilingualism, (4) socioeconomic status, and (5) intelligence.

SEX

Despite wide variations in sampling and methodology, almost all investigations show that girls are superior to boys in practically every phase of language development. However, when intelligence and socioeconomic background are held constant, and where the situation does not discriminate against the interests of either sex, the superiority of the girls is less marked. It is interesting to note that sex differences in languages are even more pronounced at the lower than at the higher socioeconomic levels.⁶⁶

In general, girls speak earlier than do boys. In length of response, which is the best single index of maturity in language, the girls are ahead. They also excel in word usage, correctness of sentence structure, comprehensibility of speech, and loquacity. As we have already noted, the incidence of speech defects is much lower among girls than among boys.

In addition, girls seem to maintain a slight superiority in language achievement over boys up to maturity.⁶⁷ They make better grades in English than do the boys, write longer and better themes, and have a larger use vocabulary.⁶⁸ Since school activities are so predomi-

⁶⁵ *Ibid*; also J. F. Rogers, *Speech Defects and Their Correction*, Pamphlet No. 22, United States Department of the Interior, October, 1931 Sold by Superintendent of Documents, Washington, D C

⁶⁶ McCarthy, in Carmichael (ed.), *op. cit.*, pp. 551-555

⁶⁷ Blanton and Blanton, *op. cit*; F. M Young, "An Analysis of Certain Variables in a Developmental Study of Language," *Genetic Psychology Monographs*, 1941, 23, 3-141.

⁶⁸ Reed, *op cit*, chap. 10 especially.

nantly verbal, girls have a distinct advantage. Because of this, some educators have suggested that boys should enter school a year later, when their added maturity would enable them to compete more successfully with girls.

EFFECT OF MULTIPLE BIRTHS

Twins, triplets, and other children from multiple births are usually slower than the average single child in developing language. In length of response twins are retarded as compared with singletons, and triplets are even more backward. This is shown in the following figures for singletons, twins, and triplets at three, four, and five years of age:⁶⁹

| | Three-Year-Olds | Four-Year-Olds | Five-Year-Olds |
|------------|-----------------|----------------|----------------|
| Singletons | 3.40 | 4.30 | — |
| Twins | 2.50 | 3.00 | 3.10 |
| Triplets | 2.78 | 2.04 | 2.98 |

In the mean number of different words used, singletons also excel, as shown below:

| | Three-Year-Olds | Four-Year-Olds | Five-Year-Olds |
|------------|-----------------|----------------|----------------|
| Singletons | 62.8 | 92.6 | — |
| Twins | 45.3 | 56.5 | 65.3 |
| Triplets | 35.3 | 26.1 | 65.6 |

With the exception of four-year-olds the proportion of incomprehensible speech, also, is much greater among triplets than in singletons. With both, however, incomprehensibility decreases with age during the preschool period. This is shown as follows:

| | Three-Year-Olds | Four-Year-Olds | Five-Year-Olds |
|------------|-----------------|----------------|----------------|
| Singletons | 8% | 30% | 1% |
| Triplets | 25 | 13 | 5 |

Twins and triplets often originate a jargon of their own which is unintelligible to others and retards their progress in language. In a recent study of triplets 42 percent of the parents reported the existence of such a jargon.⁷⁰ Although the status of being a twin or a triplet has an adverse effect upon the growth of language during the

⁶⁹ Reproduced from R. W. Howard, "The Language Development of a Group of Triplets," *Journal of Genetic Psychology*, 1946, 69.181-188

⁷⁰ *Ibid.*

preschool years, this disadvantage becomes less after school entrance, as a result of wider social contacts.

In their early development the Dionne quintuplets made relatively slow progress in language. This is thought to be partly due to the fact that their needs were so adequately met by grunts and gestures. Compared with single children, the quintuplets were retarded from six to eight months for syllables and 16 to 18 months for words.⁷¹

BILINGUALISM⁷²

The knowledge of only one language seems scarcely adequate today with the increasing emphasis upon better international understanding and the closer contacts between peoples made possible by modern means of transportation and communication. If a second or third language is to be learned, the question arises as to whether or not it should be acquired during the preschool years or should be deferred until the high school period. Experimental data on the effect of bilingualism upon general language development are meager. Available evidence, however, suggests that young children can learn a foreign language quite easily, and that mastery is much more complete if the acquisition of the second language is begun in the early years.

There seems no reason to believe that learning two languages necessarily results in serious retardation in talking. Children in bilingual environments begin to use words as early as do those in monolingual homes. However, if another language is introduced immediately after active speech is acquired, talking may be reduced or stopped temporarily. This happens especially when a child who is accustomed to getting results with certain words in one situation is transferred to another situation where these words are no longer effective.

Since confusion results when a child hears more than one language from the same person, it has been suggested that in a bilin-

⁷¹ W. E. Blatz, M. I. Fletcher, and M. Mason, "Early Development in Spoken Language of the Dionne Quintuplets," in W. E. Blatz et al. (eds.), *Collected Studies on the Dionne Quintuplets*, University of Toronto Studies, Child Development Series, No. 6 (The University of Toronto Press, Toronto, Canada, 1937)

⁷² M. E. Smith, "Some Light on the Problem of Bilingualism as Found from a Study of the Progress in Mastery of English Among Preschool Children of Non-American Ancestry in Hawaii," *Genetic Psychology Monographs*, 1939, 21: 119-284; also W. F. Leopold, *Speech Development of the Bilingual Child* (George Banta, Menasha, Wis., 1939).

gual home the mother speak to him in one language and the father in another. Nevertheless, children who are reared in homes where two or more languages are spoken often interchange words from the different languages, as is illustrated in the following quotation:

"Pem was a nice boy. Very handsome. He had a lot of toys, so we liked him. Ilse was my (Patience's) best friend. She was very fat and had red cheeks and was very polite. Her mother was the *portier* around the corner. Her father was *arbeitlose*."⁷³

The most elaborate study yet made of the effects of a polyglot environment on language development was carried on in the Hawaiian Islands.⁷⁴ Here several dialects of Chinese, Japanese, and Filipino are spoken, as well as Korean and Portuguese, native Hawaiian, and a corrupt form of English known as "pidgin English." Results indicated that the spontaneous language used in play and home situations by the group of children studied showed serious retardation. At school entrance their speech was comparable to that of the average three-year-old reared in a monolingual environment. The investigator attributes this retardation to two factors. Bilingualism accounts for the preponderance of such immature forms as interjections, short sentences, and the lack of pronouns and connectives, etc., while pidgin English is responsible for the incorrect expressions employed.

It should be borne in mind that the language situation in Hawaii is not typical of that found in a less cosmopolitan environment; therefore generalizations from the study just cited are not necessarily applicable to other bilingual situations, such as those existing in French Canada or in Switzerland. Neither are they pertinent to the typical bilingual American home. Until we have further scientific evidence to the contrary, the most reasonable conclusion seems to be that under ordinary circumstances bilingualism need not interfere with the normal development of language.

Socioeconomic factors, also, frequently are associated with bilingualism, and these sometimes may be more important than having to learn two languages.

⁷³ *Around the World in Eleven Years* by Patience, Richard, and John Abbe (Frederick A. Stokes Company, New York, 1936), p. 90

⁷⁴ M. E. Smith, "Some Light on the Problem of Bilingualism as Found from a Study of the Progress in Mastery of English Among Preschool Children of Non-American Ancestry in Hawaii," *Genetic Psychology Monographs*, 1939, 21:119-284.

SOCIOECONOMIC STATUS

Children who come from homes of superior socioeconomic status usually are advanced in language, and, conversely, those from lower-class homes are handicapped by the speech in their immediate environment. In a study made in Geneva, Switzerland, children from the educated classes were found to be eight months advanced in language development over children from the working classes.⁷⁵ Results of a more recent survey of ninth- and tenth-graders in a Midwestern American community⁷⁶ also showed a consistently positive relationship between social status and recognition vocabulary. In general, recognition vocabulary scores increased as social status advanced. However, there was considerable overlapping between the four social levels according to which the subjects were classified. These findings are presented in the following data. It should be noted that there is no "upper" class, because the representatives of this group had no children in these grades.

SOCIAL CLASS AND RECOGNITION VOCABULARY SCORE⁷⁷

| Social Class | Mean Score | Range of Scores (in thousands) |
|--------------|------------|-----------------------------------|
| Upper middle | 45,600 | 35-57 |
| Lower middle | 41,700 | 31-54 |
| Upper lower | 37,900 | 18-60 |
| Lower lower | 28,800 | 16-41 |

Both abroad and in the United States parents in the middle classes feel that the language used by their children is highly important, because they think that it reflects home training and background.⁷⁸ These parents are zealous, therefore, in trying to get their children to conform to what they believe to be good usage, and in discourag-

⁷⁵ Stern, *op. cit.*, p. 176.

⁷⁶ M. J. Schulman and R. J. Havighurst, *op. cit.*, pp. 437-442. For a description of the community and a definition of social classes read R. J. Havighurst and L. L. Janke, "Relations Between Ability and Social Status in a Midwestern Community, I: Ten-Year-Old Children," *Journal of Educational Psychology*, 1944, 35:357-368.

⁷⁷ Schulman and Havighurst, *op. cit.*, p. 442; see also study by F. M. Young, *op. cit.*

⁷⁸ C. Buhler, *The Child and His Family* (translated by H. Beaumont) (Harper & Brothers, New York, 1939).

ing or prohibiting slang, swearing, and corrupt speech.⁷⁹ In the lower-class home, on the other hand, conventional language is not so important a factor. Ungrammatical, vulgar, profane, and obscene expressions are accepted as a matter of course by children and adults, and no social stigma is attached to their use. For example, when a lower-class child, playing doctor, says: "I'll open up your belly!"⁸⁰ no one thinks of reproving him, although such an expression would shock a middle-class mother or teacher. Similarly, when a woman says of an intimate friend, "Me and her, we ain't never had no fusses," her remark is considered to be an acceptable statement by her lower-class associates.

This situation gives rise to an important educational problem, the full significance of which is only beginning to be realized. American schools are dominated by middle-class teachers⁸¹ who expect all children to conform to their conventional forms of language. Because of this the lower-class child is often punished and humiliated in school for using lower-class expressions. Name calling, swearing, and the use of certain unacceptable Anglo-Saxon words pertaining to sex are typical illustrations. This problem is difficult to solve, since it means that the teacher must find a way to make the lower-class child feel that he is not rejected as an individual, even though his language is undesirable. With the serious shortage of teachers during and since World War II, an increasing number of individuals from lower-class homes are entering the teaching profession in some areas. It will be interesting to observe the effect which this may have upon the school adjustment of the lower-class child. Some of these teachers may be more sympathetic toward him, whereas others, in their attempt to lose their identification with the lower class, may be more antagonistic. Again, if such teachers not only tolerate lower-class speech but also use it themselves, what effect may this have eventually upon the language of *all* their pupils?

INTELLIGENCE

Language and intelligence are closely related to each other. This is true not only of the onset and intelligibility of speech but of its

⁷⁹ W. A. Davis and R. J. Havighurst, *Father of the Man* (Houghton Mifflin Company, Boston, 1947), pp. 114-116.

⁸⁰ M. M. Hughes, "Learning New Ways of Behaving," *Childhood Education*, 1945, 22.125-131

⁸¹ Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 34 by A. Davis, especially pp. 609-610

later development as well. In fact, the age of talking as an index of intelligence has been emphasized so strongly that a mother often is quite perturbed if the child is slow in this respect. In general, bright children talk earlier than do normal children, and subnormal children are slower than the average in talking. This is shown by the following comparisons adapted from two different studies:⁸²

MEAN AGE FOR TALKING

| | |
|------------------------|--------------|
| Normal children | 15.32 months |
| Feeble-minded children | 38.52 |
| Gifted boys | 11.74 |
| Gifted girls | 11.01 |

Although subnormal children are slow in talking, and idiots never talk, they show more variability in this respect than do normal or gifted children. It should be remembered, also, that not all children who are late in talking are subnormal.

In a previous section of this chapter we have shown that the intelligibility of the speech of the normal preschool child improves markedly and he is readily understandable by the time he enters school. This is not true, however, of feeble-minded children. In an investigation of a group of four-year-olds who were about imbecile level, it was found that their speech sounds resemble those of normal children around one year of age. Another survey of 2500 institutionalized mental defectives showed that two-thirds do not speak normally, and that the lower the intelligence the more unintelligible the speech becomes.⁸³

Extensive studies on bright children reveal not only that they talk earlier than the average but also that their language is much more mature.⁸⁴ In fact, their characteristic use of adult expressions often makes them seem old for their age. There may be a few bright children who are inarticulate, but most of them are extremely talkative, and one of the problems their parents have is to keep them from

⁸² L. Terman, *Genetic Studies of Genius*, Vol. I, *Mental and Physical Traits of a Thousand Gifted Children* (Stanford University Press, Stanford, California, 2nd ed., 1926), p. 187; C. D. Mead, *The Relation of General Intelligence to Certain Mental and Physical Traits* (Contributions to Education, Teachers College, Columbia University, New York, 1916), p. 117.

⁸³ Carmichael (ed.), *op. cit.*, chap. 10 by D. McCarthy, p. 547. Studies of Irwin and also of Sirkin and Lyons are quoted.

⁸⁴ See L. S. Hollingworth, *Children Above 180 IQ* (World Book Company, Yonkers, 1942).

monopolizing adult conversation.⁸⁵ Usually they learn several languages with little or no confusion before they enter high school. They also like to speak before groups and enjoy dramatization.

As we have seen, there is fairly steady progress in language facility with age and grade, but there is still no agreement as to the factors responsible for this improvement. As yet we cannot say definitely what proportion of language achievement can be attributed to intelligence and how much can be accounted for by good home background and effective school instruction. A high degree of relationship has been found between intelligence and scores on standardized language tests, especially those on vocabulary or those of the completion type. Lower correlations have been obtained between intelligence and the results of informal, teacher-made language tests, but these are not to be taken too seriously because of the unreliability of such measures. Apparently intelligence is the most important single factor in determining the quality of English composition. This is true in relation to clearness and coherence, but is not necessarily so in mechanics and the use of punctuation, which seem to be due primarily to training.⁸⁶

SPECIAL LANGUAGES USED BY CHILDREN AND ADOLESCENTS

Our discussion of language development would be incomplete without mentioning some of the special kinds of language commonly used by children and adolescents. Of these interesting forms of communication we shall consider: (1) secret languages, (2) language jags and singsongs, (3) slang, and (4) taboo expressions.

SECRET LANGUAGES

As far as we know, secret languages have been employed since the time of Queen Elizabeth⁸⁷ and have been passed on from one generation of children to the next. They are not restricted to any one geographical area but are found in all countries of the Western world. It has been estimated that about 10 million American children below 17 years of age either speak or have spoken at least one of the secret

⁸⁵ H. H. Goddard, *School Training of Gifted Children* (World Book Company, Yonkers, 1928).

⁸⁶ Reed, *op. cit.*, pp. 180-181.

⁸⁷ C. Brownstone, "Why Children's Secret Languages," *Parents' Magazine*, 1940, 15:30-31, 38, 40.

languages. The most popular of these, Pig Latin, also is spoken by some 40 million adults. Opish (pronounced ahpish) ranks second to Pig Latin in popularity, but is probably spoken by fewer than a million people. Others which are used still less frequently are Double Dutch, Tutahash, and Turkey Irish.⁸⁸

Interest in secret languages begins around 5 or 6 years, increases rapidly between 9 and 12, reaches a peak at 13, and declines between 17 and 18. In some cases this interest is short lived, in others it may last for 10 or 12 years. As might be expected, secret languages appeal more to girls than to boys.⁸⁹

Numerous reasons have been suggested for the use of secret languages. Little children, when asked why they speak them, often say, "Just because I like to." Among older children, however, secret languages are used for much more subtle purposes. They serve as a means for outwitting adults and preventing them from prying into youthful affairs. They also exclude outsiders from the "secrets" of a particular clique or gang, and during adolescence may serve as an outlet for satisfying curiosity about sex.⁹⁰

The rules behind these secret languages usually are simple, but to the uninitiated they appear quite formidable and complicated.⁹¹

Pig Latin is based upon the principle of inversion plus "ay." That is, one puts the first letter of a word at the end and adds "ay." There is no inversion, however, if the word begins with a vowel, but "way" is added at the end. A few other exceptions are necessary to take care of certain types of words. Some examples of Pig Latin are:

| English | Pig Latin |
|-----------|-------------|
| boy | oybay |
| our | ourway |
| secret | ecretsay |
| languages | anguageslay |
| for | orfay |

Opish is formed by adding the syllable "op" after every consonant in a word. The vowels are not affected. Some illustrations are.

⁸⁸ Bender, "Ourway Ecretsay Anguageslay," *New York Times Magazine*, December 31, 1944, sec. 6, p. 14

⁸⁹ A. E. Tanner, *The Child* (Rand McNally and Company, Chicago, 1904), pp. 415-416.

⁹⁰ Bender, "Ourway Ecretsay Anguageslay," *New York Times Magazine*, December 31, 1944, sec. 6, p. 14

⁹¹ Brownstone, *op. cit.*

| English | Opish |
|------------|------------------------|
| Billy | Bopiloplopyop |
| Ten Tigers | Topenop Topigoperopsop |
| afternoon | afoptoperopnopoonop |

In Double Dutch the pronunciation of the vowels is retained, but a syllable is substituted for every consonant. For instance:

| | |
|------------|------------|
| a is a | n is nun |
| b is bub | o is o |
| c is cash | p is pup |
| d is dud | q is quack |
| e is e | r is rug |
| f is fuf | s is sus |
| g is gug | t is tut |
| h is hutch | u is u |
| i is i | v is vuv |
| j is jug | w is wash |
| k is kuk | x is xux |
| l is lul | y is yub |
| m is mum | z is zub |

Some examples of Double Dutch words are.

| English | Double Dutch |
|---------|-----------------|
| scram | suscashiugamum |
| go | gugo |
| Mary | Mumarugyub |
| secret | susecashrugetut |

Tutahash is similar to Double Dutch except that different syllables are substituted for *c*, *h*, *r*, *w*, *x*, *y*, and *z*. They are as follows:

| | |
|-----------|------------|
| a is a | n is nun |
| b is bub | o is o |
| c is cus | p is pup |
| d is dud | q is quack |
| e is e | r is rur |
| f is fuf | s is sus |
| g is gug | t is tut |
| h is hash | u is u |
| i is i | v is vuv |
| j is jug | w is w |
| k is kuk | x is x |
| l is lul | y is yum |
| m is mum | z is zuz |

| | |
|---------|---------------|
| English | Tutahash |
| scram | suscusruramum |
| Mary | Mumaruryum |

Turkey Irish is less widely known but is used in Yonkers, New York. It is formed by adding "ab" before vowels, as, for example:

| | |
|---------|----------------------------|
| English | Turkey Irish ⁹² |
| boy | baboy |
| scram | scrabam |
| Mary | Mabaiy |
| tiger | tabigaber |

LANGUAGE JAGS AND SINGSONGS

Between the fourth and sixth years many children develop "language jags" wherein they use silly and sometimes objectionable language.⁹³ This may be due either to their fondness for sound repetition or to their desire to appear grown up. In some cases, also, language jags are used as a means of "showing off" for the benefit of other children and adults

The following example⁹⁴ illustrates this tendency:

she she shum
licky lac bum
shir shir shum
licky lac zum.

"Singsongs" also occur, as:

Eddie has a gir-l.
Eddie has a gir-l.

or

Davy's teacher's pet.
Davy's teacher's pet.

⁹² Bender, "Ourway Ecresay Anguageslay," *New York Times Magazine*, December 31, 1944, sec 6, p 14

⁹³ R H Alschuler and C. Heimig, *Play: The Child's Response to Life*, Vol. II of *Childhood: The Beginning Years and Beyond* (Houghton Mifflin Company, Boston, 1936), pp. 48-49, L C. Wagoner, *The Development of Learning in Young Children* (McGraw-Hill Book Company, Inc., New York, 1933), chap. 18.

⁹⁴ C. M. Dixon, *High, Wide and Deep* (The John Day Company, New York, 1938), p. 138.

Older children also indulge in this "sound" play, as is illustrated by the following dialogue between a 10-year-old boy and girl in imitation of some high school students. One would repeat a line and the other would follow with the next.

What do you mean, jelly bean?
Just what I said, hammer-head.
Don't feed me that line, Frankenstein.
Get the point, double joint?
That I will, Brother Bill.
Glad you do, Sister Sue.

This fondness for the sounds of words is also evident in the speech of teen-agers, some of their expressions being, in reality, a modification of language jags. The following are typical illustrations contributed by a 16-year-old girl:⁹⁵

What's buzzin, Cousin?
What's doin, Cooin?
What's ruff, Stuff?
What's cookin, Good Lookin?
What's clckin, Chickin?

SLANG

With the possible exception of the French it has been said that Americans produce and employ more slang than any other people.⁹⁶ This is certainly true of children and adolescents, who make extensive use of slang expressions.

Slang is considered to be an unauthorized form of speech which varies greatly from year to year and from one community to another. Expressions that are popular at any given time soon are outmoded, but while they are in vogue they are thought to be apt and colorful. "Petting," "necking," and "smooching" were passé in 1947 and had been supplanted by "indulging" in California, "scooterpooping" in Georgia, "a giraffe party" in Des Moines, and "making out" in Boston. The former "drip" developed into one who was not "hep," or a "square," but now is a "Pierre." A boy who formerly was "in the know" is now a "jill." Pretty girls are "queens"; "chicks" are standard "date bait"; "beasts" are unattractive girls, and "pigs" are girls who

⁹⁵ See *Life*, "Letters to the Editors," January 1, 1945, 18·2.

⁹⁶ H. L. Mencken, *The American Language* (Alfred A. Knopf, New York, 2nd ed., 1936), p. 567.

act cheap.⁹⁷ By the time this book appears many of these terms, doubtless, will have been replaced by more up-to-date slang.

Interestingly enough, the motives for using slang vary with age. During childhood it is largely the result of imitation, just as are other, accepted forms of speech. By employing certain slang expressions, also, the child identifies himself with a favorite parent or with an older child whom he admires. In addition, being able to say such words with a certain air of bravado makes him feel important and grown up. During adolescence slang serves to inflate the ego, and provides emotional release. It is used, also, for exchange of information and gossip and facilitates social contacts.⁹⁸

There are two age levels when slang reaches a peak. One occurs around 14 or 15 years, and the other around the end of the second decade. The extent to which its use persists depends largely upon the social and cultural status of the individual.

TABOO EXPRESSIONS

Like slang, swearing is an unauthorized form of speech, but it differs in being usually considered offensive. However, it is employed by individuals of all ages, and many of the reasons for its use are similar to those which apply to slang.⁹⁹ The fact that certain words are taboo is in itself often an inducement to their use. Children, especially, may use profanity to compensate for their feelings of inferiority and of insecurity. Some of these are engendered by the child's small stature, and swearing makes him feel big and important. Taboo words or phrases may appeal because they are thought to be more expressive or to have a more masculine feeling tone, whereas some are used naturally as a result of lower-class background. These motives are well illustrated by the following incident. A group of eight- and nine-year-old boys playing football had asked two high school boys to be referees. After about 15 minutes of play one of the referees became disgusted and exclaimed:

"Hell, I'm not going to referee this damned sissy football game. I'm going home!" Calling to his friend he said, "Let's get the hell out of here, Jim."

⁹⁷ "High-School Fads (This Year's Jills and Queens Try Hard to Be Different)," *Life*, November 17, 1947, 23:119-123.

⁹⁸ M. C. Jones, "A Functional Analysis of Colloquial Speech Among Adolescents," *American Psychologist*, 1946, 1:252-253.

⁹⁹ E. Hurlock, *op. cit.*, p. 172.

These boys were from middle-class homes where such language is not tolerated. Obviously, its use added to their feelings of masculinity and superiority over the younger boys.

THE SOCIALIZATION OF SPEECH

Psychologists often make a distinction between social and non-social speech. If a child carries on a monologue just for the sake of talking, whether anyone is listening or not, and if his remarks are about himself, his language is designated as egocentric or nonsocial. His speech becomes socialized, however, as soon as he includes others in his remarks, and where he exchanges ideas with his hearers and tries to influence them.¹⁰⁰ Egocentric speech may be an aid to the child's thinking, but it is through talking to others that he becomes socialized.

There is still some disagreement about the proportion of egocentric speech present in preschool children. A Swiss investigator¹⁰¹ working intensively with two six-year-olds classified 38 percent of 1500 remarks made by each of them as egocentric and 62 percent as socialized. A study of a group of 72 gifted preschool children¹⁰² showed egocentricity in 34 percent of their speech. Other investigators working with groups more characteristic of the general population find less than 4 percent of the speech of preschool children to be egocentric.¹⁰³ These are only a few of the representative studies which have been made on egocentric speech. It is difficult to summarize the findings on this topic, however, because the different investigators vary so greatly in their definitions of terms and in their interpretation of data.

The numerous questions asked by preschool children, especially around the age of three years, often are somewhat baffling to parents.¹⁰⁴ It should be remembered that many of these questions are asked by the child merely for the sake of talking and that no answer is expected. In some instances, however, the child is genuinely seeking to increase his knowledge, and in such cases either his question

¹⁰⁰ J. Piaget, *The Language and Thought of the Child*.

¹⁰¹ *Ibid.*

¹⁰² Fisher, *op cit.*

¹⁰³ McCarthy, "A Comparison of Children's Language in Different Situations and Its Relation to Personality Traits," *Journal of Genetic Psychology*, 1929, 36: 583-591.

¹⁰⁴ M. H. Bro, *When Children Ask* (Willett, Clark and Company, Chicago, 1940).

should be answered directly or by skillful guidance he should be led to answer it himself. From their knowledge both of the child and of the situation adults will have to determine which questions are to be answered and which are to be ignored.

It must not be thought, however, that egocentric speech is unique with preschool children. It is present, also, in the conversation of older children, adolescents, and adults. An interesting study was made to determine the amount of egocentricity in the conversation of college women.¹⁰⁵ To get complete spontaneity eavesdropping techniques were employed. The two women who gathered the information hid under beds during parties and listened in on telephone conversations. They also recorded casual remarks overheard in dormitory washrooms and smoking rooms. In all, 3000 remarks were analyzed and 40.7 percent of them were found to be ego-related. If these results are representative of mature adults, then parents need not be concerned too greatly over the nonsocial speech of preschool children.

SUMMARY

Language is the most complicated and the most human of our activities. Although the time of acquiring speech differs with the individual child, language development follows a rather definite sequence, which we have divided arbitrarily into six stages.

The crude beginnings of speech date from the reflex sounds of the neonate and the cries which become differentiated after the third week of life. Vowel sounds are the first to appear, those produced in the front of the mouth occurring first, the middle next, and the back last. The reverse is true of consonant sounds, those formed in the back of the mouth appearing first. These early vowel and consonant sounds are produced in response to physiological needs and as accompaniments to general bodily movements.

As soon as the infant makes these sounds spontaneously, and when they become a sort of vocal play, he has reached the babble stage. Toward the end of this period circular reflexes appear wherein the child imitates his own speech sounds with resulting chains of vocalizations or babbling.

Next comes the word-using stage, wherein the child imitates the

¹⁰⁵ M. Henle and M. B. Hubbell, "Egocentricity" in Adult Conversation," *Journal of Social Psychology*, 1938, 9:227-234.

words spoken by others. This is the forerunner of connecting words with specific situations and objects, which marks the beginning of *real* speech.

Then come the one-word-sentence stage, where a noun is used to convey the meaning of a sentence, and the stage in which the child combines two or more words, usually a noun and a verb.

The last stage, involving the mastery of complex uninflected speech forms, begins around the age of three years and continues until mental maturity and beyond.

Despite great variability in the methods employed to study vocabulary, it may be concluded that the increase in *use* vocabulary is proportionately great during the preschool years. This ability to use words increases relatively slowly during early childhood and then more rapidly in later childhood and adolescence. At all levels of development *recognition* vocabulary greatly exceeds *use* vocabulary. Recent investigations show, also, that recognition vocabularies are much larger than was indicated by the older studies.

As the child matures he progresses from the use of one word or very short, simple sentences to longer compound, complex, and compound-complex sentences. The position of the clause within the sentence also is an index of maturity.

There are a number of reasons why children may be slow in talking, and one must be familiar with all the factors concerning a child's development before drawing conclusions on this point.

Language difficulties of preschool children include the omission of essential words, errors in the use of verbs, pronouns, and prepositions; incorrect formation of plurals; word coinage, use of onomatopoeic words; mutilations; substitutions; and transpositions.

Many of the early errors in grammar persist into later childhood and maturity. Studies have shown, however, that the mistakes in English of older individuals result from the repetition of but a few basic errors.

More serious speech difficulties which occur among children and adolescents are stuttering and stammering. The three periods when these are most likely to arise are: (1) when meaningful speech first develops, (2) between five and seven years, and (3) during adolescence. Most of the cases, however, begin before the age of six years. Heredity has been suggested as a possible contributing cause to stuttering and stammering. Changing handedness once was believed to

be a cause, but present evidence does not support this conclusion. Probably the most important causes are emotional tension and conflict, and these in turn are fostered by the social maladjustment resulting from the speech handicap. Even when stuttering and stammering are corrected, their effects upon personality may be permanent.

Girls are somewhat superior to boys in practically every phase of language development and achievement up to maturity.

Children from multiple births, such as twins and triplets, usually are slower than the average singleton in language development, but this retardation becomes less evident after school entrance.

With the present emphasis upon the desirability of knowing more than one language, the question arises as to the effect of bilingualism upon language development. Experience shows that young children can learn a second language with ease, and that if reasonable care is taken little confusion should occur. When several languages are spoken, however, serious retardation in speech may result.

Language is greatly influenced by socioeconomic status. In general, children who come from superior homes are advanced in language development, whereas those from inferior homes are retarded. The type of speech which an individual uses, also, is influenced greatly by the social class to which he belongs.

There is a close correlation between language and intelligence. Bright children talk earlier and have more mature vocabularies than do children of average or inferior intelligence.

Secret languages are popular not only in the United States but in other countries as well. They are used primarily to outwit adults and others who do not belong to a particular group, clique, or gang.

Language jags and singsongs are a type of vocal play common among children and in modified form among adolescents.

Slang is an unauthorized form of speech which varies from year to year and from one community to another. The motives for its use differ with age, and its occurrence reaches a peak around 14 or 15 years and again at the end of the second decade.

Taboo expressions are used mainly as a means of relieving emotional tension or of making the individual feel more grown up or masculine.

The extent of an individual's socialization may be shown by the amount of egocentricity in his speech. There is still no agreement,

however, as to the proportion of egocentricity in the speech of children. Studies show that mature individuals also use a fairly large number of ego-related expressions in spontaneous conversations.

Throughout this chapter we have had numerous occasions to point out the close relationship existing between language and intelligence. In the next chapter we shall turn to a more detailed consideration of the nature, development, and appraisal of intelligent behavior.

SUGGESTED ACTIVITIES

1. Observe the speech sounds made by an infant about six months old and classify them roughly.
2. Check with some parents about the age at which they claim their children began to talk, and compare this with the criterion for *real* speech given in your text.
3. (a) Keep a list of words which you can recognize but cannot define. (b) Take a standardized vocabulary test and compare your rating with the norms.
4. Collect and classify examples of language difficulties and the most common language errors in the speech of. (a) children in your family or neighborhood, (b) "G" in your text, and (c) yourself.
5. (a) Bring to class (withholding names) illustrative cases of stuttering and stammering of which you may know. (b) What effects did the speech handicap have on the individual's personality?
6. Cite examples wherein lower-class speech interfered with social adjustment both in and out of school.
7. Write the words "child development" in Pig Latin, Opish, Double Dutch, Tutahash, and Turkey Irish.
8. Bring in illustrations of language jags and singsongs
9. Collect examples of slang current among junior and senior high school students and compare them with those which were popular when you were in high school.
10. Try to listen unobserved to the spontaneous conversations of some fellow students and note the proportion of egocentric remarks.

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CHAPTER 7

HOW INTELLIGENT BEHAVIOR DEVELOPS

WHAT IS INTELLIGENCE?

The argument about what intelligence is actually dates from the time of the ancient Greeks. In the modern meaning of the term, however, the controversy goes back about half a century, reaching its height at the close of the First World War. In the past we have acknowledged frankly our inability to define intelligence satisfactorily and have called to our defense its rather trite analogy to electricity. We have admitted that we cannot define electricity adequately, but we have been able to measure it and use the results in numerous practical ways. Although there is still considerable uncertainty as to what intelligence is, some psychologists feel that they have a technique which will tell us how it operates and what factors we can measure. Whether or not we believe that we have arrived at a satisfactory definition of intelligence, we are forced to admit that it is measurable and that the results obtained are satisfactory for general purposes.

A review¹ of a few of the more modern definitions of intelligence

¹ J. Peterson, *Early Conceptions and Tests of Intelligence* (World Book Company, Yonkers, 1925), chap. 1, W. F. Dearborn, *Intelligence Tests; Their Significance for School and Society* (Houghton Mifflin Company, Boston, 1928), chap. 4; W. Stern, *The Psychological Methods of Testing Intelligence* (translated by G. M. Whipple) (Warwick and York, Baltimore, 1914), pp 1-5, "Intelligence and Its Measurement: A Symposium," *Journal of Educational Psychology*, 1921, 12:123-147, 195-216, 271-275, D. G. Ryans, "The Concept

shows that our conceptions of it are not so radically different from each other as might appear at first glance. For instance, intelligence has been defined as "one's ability to carry on abstract thinking," or as the "capacity for abstraction." This would limit it to cortical activity, which involves the higher brain centers, and would minimize the role of sensorimotor and perceptual behavior.

Others would restrict the term to "the ability to generalize," i.e., to recognize common elements in a group of diverse situations. For example, one generalizes when he sees that 3 and 2 of *anything* always make 5 of *anything*. This ability, although important, represents only one aspect of intelligent behavior.

A pioneer in the field of mental measurement regards intelligence as "a complex process involving thinking, adaptation, and autocriticism," which limits it also to higher thought processes.

In defining intelligence as a "way of responding to problem situations in a rational manner," the emphasis again is upon cortical behavior. The same is true of the well-known definition which implies that intelligence is "a general capacity of an individual consciously to adjust his thinking to new requirements."

Probably one of the most popular concepts of intelligence is that of "learning ability" or "the capacity to profit by experience." This concept implies both the rate—the quickness with which one "catches on"—and the ability to show improvement. One of the principal dangers associated with the definition of intelligence as the "capacity to learn," however, is the tendency to confuse this *capacity* with *knowledge*, or what is learned. The mere accumulation of facts is not synonymous with intelligence, but the degree to which an individual can acquire, retain, and apply facts would depend upon his intelligence.

After reviewing the different concepts of intelligence which have been held by various writers from Aristotle down to the present day, Goddard concludes that "intelligence is the degree of availability of one's experiences for the solution of immediate problems and the an-

of Intelligence," *Journal of Educational Psychology*, 1938, 29:449-458; G. C. Schwesinger, *Hereditry and Environment: Studies in the Genesis of Psychological Characteristics* (The Macmillan Company, New York, 1933), chaps. 1 and 4; G. M. Whipple (ed.), *Intelligence Tests and Their Use. The Twenty-First Yearbook of the National Society for the Study of Education* (Public School Publishing Company, Bloomington, Ill., 1922), Part I; G. D. Stoddard, *The Meaning of Intelligence* (The Macmillan Company, 1943), chap. 1.

ticipation of future ones.”² This definition stresses the importance of both first-hand and vicarious experiences. The intelligent individual “*remembers* his experiences, he uses his *imagination*. But most of all, he *thinks* about them, *studies* them, *reasons* about them, and exercises *judgments*.” It is the *availability* of these experiences, however, when problems must be solved, that is the crucial factor in intelligent behavior. In this definition the emphasis again is upon the higher thought processes.

Still another definition which is not quite so typical states that intelligence comprises three types of activity: (1) abstract intelligence, or the ability to carry on abstract thinking; (2) mechanical intelligence, which involves manual and motor skills (i.e., the ability to make things, etc.); and (3) social intelligence, or the ability to adjust to or get along well with others.

Summarizing these opinions, then, we may say that to many psychologists intelligence is the ability of the individual to make various types of adjustments. Some define these in rather broad terms, while others limit them to one or more specific types. Most seem to agree, however, that intelligent behavior is associated with conceptual activity or thinking. There is a recent tendency, also, to regard intelligence as a *quality*³ of behavior rather than as an *entity* or a thing in itself. According to this view it would be more correct to speak of “intelligent behavior” than to use the term “intelligence.” Nevertheless, we have been accustomed to think of intelligence in a substantive sense for so long that we probably never shall learn to use it solely as an adjective or adverb.

Perhaps the clearest concept of intelligence is the one which holds that it is our appraisal of how quickly and how well a person behaves in everyday situations. For our purposes we shall limit intelligence to mean adaptive behavior resulting primarily from the activity of the higher brain centers. Other adjustments, such as social and mechanical, will be considered as a part of personality—as being *associated with* intelligent behavior—but not as components of intelligence. It is recognized, also, that numerous other conditions affect the expression of intelligence. For instance, emotional conditioning

² H. H. Goddard, “What Is Intelligence?” *Journal of Social Psychology*, 1946, 24:51-69; see especially p. 68.

³ H. E. Garrett, “A Developmental Theory of Intelligence,” *American Psychologist*, 1946, 1:372-378.

and socioeconomic status are important because they may influence profoundly the individual's ambitions and attitudes toward achievement.

HOW IS INTELLIGENCE ORGANIZED?⁴

The question as to how intelligence is organized has interested both scientists and laymen for a number of years. Is intelligence a single ability, or is it the expression of many differing abilities? If it is not a single capacity, are the different capacities distinct from each other, or are they closely related?

FACULTY PSYCHOLOGY

In the latter part of the nineteenth century when faculty psychology was still popular, it was believed that the mind was composed of a few basic, independent abilities or faculties, such as memory, attention, imagination, reasoning, and will. Furthermore, it was thought that an individual would be either uniformly good or uniformly poor in all aspects of a given faculty. For example, if one had a superior faculty of memory he would remember equally well dates and events in history, chemical formulas, faces, places, numbers, and words. Conversely, if he had a poor faculty of memory he would be unable to remember any kind of data. Each faculty was regarded as functioning independently of the others. Thus, it was believed that the person who had a poor memory might reason well, or that one with a vivid imagination might be poor in attention or unable to reason effectively.

The results of scientific research, however, showed that the theory of mental faculties was largely erroneous.⁵ Experiments indicated that training in one aspect of a certain faculty need not affect one's performance in other aspects of the same faculty. To illustrate, memorizing a stanza of poetry each day would not necessarily improve one's ability to remember other types of material. Furthermore, the

⁴ Dearborn, *op. cit.*, pp 97-100; Ryans, *op. cit.*; G. H. Thomson, *The Factorial Analysis of Human Ability* (Houghton Mifflin Company, Boston, 1939), chaps. 1 and 2; F. N. Freeman, *Mental Tests. Their History, Principles, and Applications* (Houghton Mifflin Company, Boston, rev. ed., 1939), pp. 433-444; R. B. Cattell, "The Measurement of Adult Intelligence," *Psychological Bulletin*, 1943, 40:153-193.

⁵ E. L. Thorndike, "Mental Abilities," in *Symposium on Recent Advances in Psychology, Proceedings of the American Philosophical Society*, Philadelphia, 1941, 84:503-513.

study of mathematics would not in itself improve one's ability to reason in all kinds of situations. It was said, also, that reasoning is not an independent "faculty," but is highly complex, involving attention, memory, imagination, and other processes.

In addition to the experiments on the training of abilities another approach was made through the application of statistical methods of correlation. Such methods express numerically the degree of relationship which exists between two or more sets of data. These showed that even apparently similar mathematical processes have some degree of specificity, i.e., adding fractions and adding whole numbers do not involve identical abilities. These findings make it clear that mental ability is not made up of a few basic faculties. Rather, it seems to consist of many capacities manifested in a number of different ways and with varying degrees of relationship. As we shall see, therefore, the problem has become one of ascertaining the nature and number of these different abilities and the extent to which they are related in various types of intelligent behavior.

THE TWO-FACTOR THEORY

Only a few of the better-known theories of how intelligence is expressed or organized will be discussed briefly here. About 1904 the two-factor theory was first formulated by the late English psychologist, Professor Spearman. Based upon elaborate correlational analyses, this theory maintains that all mental abilities involve two factors, a *g* factor, general intelligence, and an *s* factor, specific ability, and that these two factors are closely related and function as a unit. The *g* factor is involved in all developmental processes and is influenced by age, whereas the *s* factors are specific elements which are quite different from each other, are affected greatly by one's training and environment, and are only indirectly influenced by *g*. For example, such apparently *specific* capacities as mathematical ability, facility in the use of language, mechanical ability, etc., all depend for their functioning upon the presence of the common integrating factor, *g*. Furthermore, this general capacity, which pervades all intellectual activities, tends to make the individual who is superior in one activity better than average in others. For instance, a teacher who upholds this theory would insist that her superior students are good in everything they do.

In his later work Spearman discovered that some specific factors

occur in closely related groups, a very significant conclusion in the light of recent research. Because of these "group" factors his hypothesis actually should be called a "three-factor"⁶ rather than a "two-factor" theory.

THE MULTI-FACTOR THEORY

Another theory, known as the "multi-factor theory," was formulated by Professor E. L. Thorndike after years of careful experimentation. It is his contention that intelligent behavior is not a unitary process, but manifests itself in many different ways. In other words, "intelligence is the arithmetical sum of a series of varied and unrelated abilities." These abilities are quite diverse and are not necessarily related to each other. Whatever apparent relationship may exist is due to the overlapping of different functions rather than to a common or general intellectual factor. These different "intelligences" may be grouped roughly into three classifications: (1) abstract, (2) mechanical, and (3) social. The first is concerned primarily with the ability to handle symbols, the second deals with the manipulation of things, and the third is manifested by the individual's ability to handle people and to get along with them. According to this hypothesis an individual who does excellent academic work, where he must manipulate certain abstract principles, may or may not excel in motor or manual abilities. Furthermore, a person who is superior in handling abstract concepts or who is better than average in motor skills may experience difficulty in making social adjustments.

THE CLUSTER THEORY

A third theory, representing a position midway between the "two-factor" and "multi-factor" theories, was introduced about 1934 and is often referred to as the "cluster theory" of intelligence.⁷ By means of a complicated and laborious statistical technique, known as "factor analysis," it has been shown that certain groups or "constellations" of capacities are bound together by a common factor. However, these groups or clusters are not necessarily related to each other. In other words, although such abilities as those involving mathematical relations may possess a common intellectual factor, it may not be the same factor as that which is common to language abilities.

⁶ Cattell, *op. cit.*, p. 168

⁷ L. L. Thurstone, "Theories of Intelligence," *Scientific Monthly*, 1946, 62: 104.

According to Professor and Mrs. Thurstone, who have been investigating this problem for the past 15 years, the following are among the most important of the so-called primary mental abilities:⁸

1. Verbal Meaning (V)
2. Space Thinking (S)
3. Reasoning (R)
4. Quantitative Thinking (Q)
5. Word Fluency (W)
6. Memory (Me)
7. Motor (Mo)
8. Perception (P)

(1) *Verbal Meaning* is concerned with "the ability to understand ideas expressed in words." This is important in reading and listening, languages, history, and science. (2) *Space Thinking* is defined as "the ability to think about objects in two or three dimensions." This is important in geometry, art, drawing, crafts, etc. (3) *Reasoning* is described as "the ability to solve logical problems—to foresee and plan." It is rated as the highest of the primary factors. It is necessary where inductive and deductive thinking are required, as in mathematics and science. (4) *Quantitative Thinking*, or "the ability to work with figures rapidly and accurately" is significant in arithmetic and mathematics. (5) *Word Fluency* is concerned with the ability "to write and talk easily" and rates highly in public speaking, drama, journalism, etc. (6) *Memory* is "the ability to recall past experiences" and is needed in many tasks both in and out of school. (7) The *Motor* factor signifies "the ability to coordinate eye and hand movements," and is necessary in such activities as writing and physical education. (8) *Perception*, or "the ability to recognize likenesses and differences between objects [and symbols] accurately and quickly," is especially important in reading, and in clerical and assembly jobs.⁹

In earlier investigations Thurstone failed to find any factor that would correspond to Spearman's *g*. However, in one study of 10-year-old children he did find a *general* factor in addition to the primary factors discovered for adults. He says (1946): "There seems to

⁸ See *Examiner's Manual* by T. G. Thurstone and L. L. Thurstone, "Tests of Primary Mental Abilities" (Science Research Associates, Chicago, 1946), p. ii.

⁹ Adapted from T. G. Thurstone, *Learning to Think Series, Play and Learn, The Red Book*. By permission of the publishers, Science Research Associates, 228 South Wabash Avenue, Chicago 4, Illinois

exist a large number of special abilities that can be identified as primary abilities by the factorial methods, and underlying these special abilities there seems to exist some central energizing factor which promotes the activity of all these special abilities."¹⁰ Since Thurstone admits the existence of "a second order general factor," there is in reality little difference between his theory and that of Spearman, who, as we saw, found certain *group factors* besides *g*.

It is interesting to note that extensive research on aviators during the Second World War tended to confirm the existence of many of Thurstone's primary abilities. No *general* or universal factor, however, in the sense in which Spearman used the term, was discovered.¹¹

After 10 years of research Professor Garrett says: "With increasing age there appears to be a gradual breakdown of an amorphous general ability into a group of fairly distinct aptitudes."¹² He thinks that the *g* factor observed at the elementary school level is largely verbal or linguistic in nature. Although this general factor is important at this period of development, it becomes progressively less so at the high school and college levels. An intelligence test, therefore, which summarizes all different abilities into a single score, such as the I.Q. (discussed in a later section), may be satisfactory for children in the elementary school. It is inadequate, however, for high school and college students, because it obscures specialized interests and abilities. At this later period a profile, such as that shown in Figure 45, probably would be more satisfactory as a means of expressing an individual's intelligence. The Thurstones believe that the profile is preferable to the I.Q. at *all* ages, because it portrays graphically an individual's special abilities and disabilities, a knowledge of which is so helpful in educational and vocational guidance.

From the foregoing, we may conclude that intelligent behavior is not the manifestation of a single ability. It is rather the functioning of a complex of many differing abilities which are related in various ways. The nature and degree of this relationship apparently are influenced greatly by age and environmental situation.

It has been suggested that the primary mental abilities listed by

¹⁰ L. L. Thurstone, "Theories of Intelligence," *Scientific Monthly*, 1946, 62: 110.

¹¹ See J. P. Guilford, "The Discovery of Aptitude and Achievement Variables," *Science*, 1947, 106:282.

¹² Garrett, *op. cit.*, p. 375.

which accompany the development of this behavior are not clearly understood even by expert neurologists and psychologists.

Despite our lack of detailed information, we do know that behavior before and soon after birth is fairly simple and is governed by the lower brain centers and the spinal cord (see p. 59). Although the full number of cells in the upper brain or cortex is present at birth, they are not sufficiently developed to function then. By the time maturity is attained, the individual is capable of dealing with abstract and complicated problems, activity known to be controlled by the cerebral cortex. It should be emphasized that this increase in the complexity of behavior is due not only to the growth of individual nerve cells or neurons but also to the building up of intricate relationships among these cells.

In general, it has been shown that certain areas of the brain are concerned with particular types of sensory and motor behavior. For example, the neurons which make seeing possible are situated in the back of the brain or occipital lobes. The neurons for hearing are at the side of the head just above the temples, the temporal areas. Motor activities are controlled by neurons located in the front part of the brain on either side of a deep cleft called the fissure of Rolando (see Fig. 13 in Chapter 3).

It is probable, however, that this localization of function in the brain is not so specific as was once believed. Experiments have indicated that if the cells in one part of the brain, especially in the motor areas, are injured or destroyed, other parts of the brain take over their function to some extent. There is, of course, a reduction in the quality of the behavior involved, and it appears that the amount of brain tissue destroyed is more important than its location. An illustration of this sometimes is seen in cases of brain tumor in which the individual's motor functions are seriously impaired immediately after an operation. As time goes on, however, there may be substantial improvement in these functions, although they do not return to normal.

As we have stressed repeatedly, intelligent behavior is concerned principally with abstract thinking and learning, and these functions result primarily from the activity of nerve cells in the cortex or upper part of the brain. The frontal lobes are believed to be especially important in intelligence, but as noted in the case of sensorimotor areas, the *total* number of cortical cells is of greater significance than

the particular area involved. Nevertheless, the frontal lobes seem to be essential in making the complex associations which are so necessary both in reasoning and in the higher types of learning. Notwithstanding the fact that there are cases on record in which serious injury to the frontal lobes was not accompanied by any marked deterioration in behavior, it seems probable that the destruction of cells in this area usually has an adverse effect upon the individual both intellectually and emotionally.

It should be recalled that the different areas of the brain do not develop at the same rate. For example, the areas concerned with motor development are far in advance of other regions during the prenatal period (see p. 59). This differential growth rate undoubtedly has an important bearing upon the course of intellectual development.

Another interesting aspect of cerebral activity is the production of electrical waves by the brain.¹⁵ These waves are detected by means of electrodes placed upon the individual's head, and are amplified and recorded by delicate instruments, the results being known as electroencephalograms, abbreviated EEG.

Four kinds of brain waves¹⁶ have been identified, differing principally in frequency or number of pulsations per second. The Alpha waves are the largest and the most widespread, and have an adult frequency of about 10 per second. They are easiest to study, and most of our knowledge of electrical activity in the brain is derived from an analysis of these waves. Beta waves have a frequency of 25 per second, and Delta waves have an individual duration of about one-sixth of a second. A new wave called a Kappa wave has been discovered, emanating from the temporal lobes of the brain. It is spindle shaped and has a frequency of about 8 to 12 per second and is associated with discrimination, choice reaction, mental arithmetic, problem solving, etc.

The general pattern of brain waves is consistent for each individual, and identical twins show similar patterns. Nevertheless, electroencephalograms show observable differences for various parts and

¹⁵ G. M. Whipple (ed.), *Intelligence. Its Nature and Nurture*, Part I, chap. 4 by L. Carmichael et al. H. H. Jasper, "Charting the Sea of Brain Waves," *Science*, 1948, 108 343-347.

¹⁶ Whipple (ed.), *op. cit.*, p. 130; J. L. Kennedy, R. M. Gottsdanker, J. C. Armington, and Florence E. Gray, "A New Electroencephalogram Associated with Thinking," *Science*, 1948, 108:527-529.

conditions of the brain. Those occurring in the occipital region (back of the head) differ in rate from those produced in the motor area in the front of the brain. The type of wave is also affected by such factors as sleeping, thinking, emotional excitement, epileptic seizures, and mental subnormality.

Electroencephalograms also show variation with age; only faint brain waves are observable in the fetus and there is no definite rhythm until about the fourth month after birth. Thereafter, the Alpha waves in the occipital region have a frequency of three to four per second, and this increases to six by the end of the first year. From then on the increase is not so rapid. By the age of five or six years the child reaches the lower level for men and women and between 8 and 12 years attains the adult rate.¹⁷

It is interesting to note that brain waves in the visual and motor areas develop at about the same time the child is able to follow an object with his eyes.¹⁸ As we saw in Chapter 5, no great advance can be made in manipulatory activities until eyes and hands are coordinated. It seems, therefore, that the development of brain waves is concomitant with the maturation and functioning of the visual and motor areas.

The exact relationship between electroencephalograms and intellectual level is not yet known clearly. It is thought that certain clinical types of feeble-mindedness have characteristic brain-wave patterns.¹⁹ Other types of mentally subnormal individuals, however, show no such characteristics.²⁰ Since the study of brain waves is of comparatively recent origin, we may look forward to much greater knowledge in this field than we possess at present.

There are other factors²¹ intimately connected with cerebral function, and consequently with intelligent behavior. It has been found, for instance, that disturbance of circulation of the brain results in confusion and mental incompetence. Oxygen deprivation, also, when chronic, may even lead to permanent imbecility. As noted in Chapter 4, abnormalities in the endocrine glands may disturb intellectual growth, as in cases of cretinism induced by the underfunctioning of the thyroid gland.

In conclusion, it may be said that any pronounced disturbance in

¹⁷ Whipple (ed.), *op. cit.*, p. 128.

¹⁸ *Ibid.*, p. 129.

¹⁹ *Ibid.*, p. 131.

²⁰ *Ibid.*, pp. 131-132.

²¹ *Ibid.*, pp. 135-139.

physiological function or any sensory disorder will have an adverse effect upon the development and function of the brain and nervous system and will be reflected in the quality of an individual's behavior.

WHAT IS THE NATURE OF MENTAL GROWTH?

In the preceding section we have shown that as yet we do not know the exact relationship between neurological and physiological development and mental function. In attempting to secure a picture of mental growth during the first two decades, therefore, we must rely solely upon the results of intelligence tests given at different age levels.

In Chapter 4 we illustrated the nature of physical growth graphically in the form of a curve. It was stressed that such a curve was largely hypothetical because of wide individual variations in the rate of growth. Nevertheless, it does show the general pattern of physical development. When we attempt to construct a curve showing the growth of intelligence, we are confronted with a somewhat analogous situation. Testing at successive age levels indicates that there is great individual variation in both the rate and the pattern of mental growth at different periods of development. However, there appears to be a sufficiently consistent trend in the course of mental growth during certain age ranges to justify its graphic portrayal.

Investigations, such as Bayley's longitudinal study in California, confirm the generally accepted conclusion that the growth of infant intelligence is extremely rapid and variable and differs in quality from that of older individuals. Until about six or eight months of age the child's development is primarily sensory and motor, contrasting sharply with the conceptual and adaptive behavior of the older child and adult. Obviously, the sensorimotor tests used with infants and young children are not measuring the same types of activities as those represented by the more complex mental functions of mature persons and, therefore, cannot be used to predict later mental status. In Bayley's opinion, "there was no evidence for a general factor of intelligence during the first three years, but the findings indicate, instead, a series of developing functions, or groups of functions, each growing out of, but not necessarily correlated with previously matured behavior patterns."²² Between the ages of four and nine

²² N. Bayley, "Mental Growth During the First Three Years. A Developmental Study of Sixty-One Children by Repeated Tests," *Genetic Psychology Monographs*, 1933, 14:83-85.

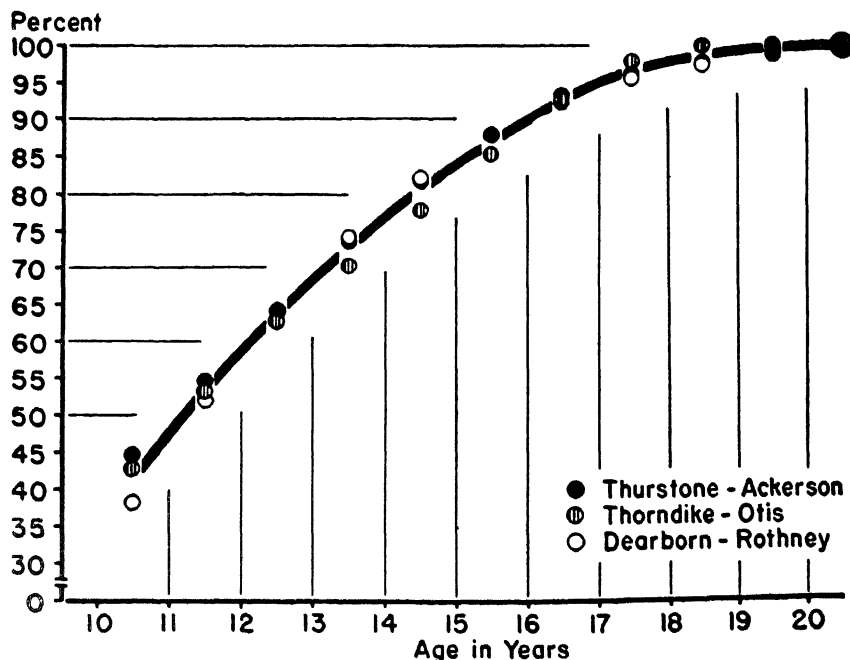


FIG 46 Three Mental Growth Curves in Percentage of Mature Status. (Reprinted from *Adolescence Forty-Third Yearbook of the National Society for the Study of Education*, Part I, 1944, N. B. Henry, ed., chap. 8 by H. E. Jones and H. S. Conrad, p. 153. By permission of the Society.)

there is somewhat greater stability in mental growth, as shown by test performance.²³ Prediction, therefore, is less hazardous at these ages, although great variability may occur in individual cases. "Some children settle into a consistent rate of growth earlier than others," and it has been found that "the more stable cases are usually those making scores near the average of the group."²⁴ Those making either extremely high or extremely low scores are less likely to maintain their positions at later ages.

After nine years of age the pattern of mental growth continues to be reasonably consistent and stable, despite individual variations. Figure 46, which shows mental growth curves obtained from three different investigations and expressed in percentage of mature status, illustrates this pattern. It will be noted that 50 percent of adult

²³ Whipple (ed.), *op. cit.*, chap. 2 by Bayley.

²⁴ *Ibid*, p. 29.

mental development has been attained by the age of 12. By 15 years of age 80 percent has been reached, and by the end of the second decade 100 percent has been attained.²⁵ It will be seen, also, that mental growth approximates a straight-line relationship with increasing age, proceeding by fairly equal increments between 11 and 16 years. Thereafter, it slows down gradually and apparently terminates around the twentieth year.

The exact age at which mental growth ceases is not so easy to determine. Here again we must remember that our knowledge of mental growth is dependent upon the results of intelligence tests. Different mental tests measure different intellectual functions, and some of these functions mature earlier than others.²⁶ Even the same test items, given at different age levels, may be measuring different mental abilities.²⁷ It has been found, also, that varying types of scoring procedures will produce different results. Because of these and other factors, any attempt to set a definite age at which mental growth ceases for *all* individuals is hardly justifiable. Nevertheless, for practical purposes it is assumed that cessation of mental growth occurs when an unselected sample of individuals fails to show any appreciable increase in test score. In view of this situation it is not difficult to understand why there has been so little agreement among psychologists concerning the upper limits of mental growth. Army data from the First World War used approximately 14 years as the age for the termination of mental growth in the average adult. Other investigators have employed 15, 16, and even 19 in the case of superior individuals. In the 1937 Terman-Merrill Revision of the Binet-Simon Intelligence Scale the gradual tapering off of mental growth is recognized between the ages of 13 and 16. This is taken into consideration in computing I.Q.'s, and 15 years is regarded as the maximum chronological age.²⁸ Results from the Wechsler-Bellevue Scale, designed especially to measure the intelligence of adults, indicate that mental growth reaches a peak around 20 years.²⁹ The curve

²⁵ N. B. Henry (ed.), *Adolescence*, Part I, chap. 8 by H. E. Jones and H. S. Conrad, p. 153.

²⁶ B. Balmsky, "An Analysis of the Mental Factors of Various Age Groups from Nine to Sixty," *Genetic Psychology Monographs*, 1941, 23.191-234.

²⁷ *Ibid.*, p. 221

²⁸ L. M. Terman and M. A. Merrill, *Measuring Intelligence*, pp. 30-31; Q. McNemar, *The Revision of the Stanford-Binet Scale*, chap. 1 by L. M. Terman, especially p. 10.

²⁹ D. Wechsler, *The Measurement of Adult Intelligence*, p. 29

drops slightly thereafter until the third decade, after which the decline becomes more apparent. The Harvard Growth Study, however, using subjects from better than average homes, showed that mental growth continued to approximately 30 years with about a 2 percent increase occurring after 21 or 22.³⁰ Results obtained with the American Council on Education (A.C.E.) group psychological examinations showed, also, that college students made noticeable gains between their freshman and senior years.³¹

Despite the wide variations in these data it seems fairly certain that mental growth, as measured by most existing types of intelligence tests, begins to slacken off sometime during early adolescence. For most people, however, it probably continues at a slower rate well into the second decade. The exact point of its termination will depend upon the nature of the individual, the particular environmental situation involved, and the specific test employed. As in the case of physical development, it probably is better to consider *individual* mental growth curves than to attempt to construct a curve based upon cross-sectional data which is characteristic of *all* individuals. Nevertheless, certain common features usually appear in most curves of mental development. There is extremely rapid growth in the preschool period and especially during the first three years. This is followed by a period of negative acceleration until somewhere in early adolescence. Many explanations have been offered to account for changes in the course of mental growth. Such explanations, naturally, are influenced by the theory which one holds concerning the organization of intelligence. Those who believe that it is primarily a *general* factor will say that this is the basic reason for the consistent nature of the mental growth curve, especially during the elementary school years. On the other hand, those who believe that intelligence is made up of a number of diverse factors would say that a single mental growth curve does not represent the facts accurately. It may give a rough composite picture of the development of some specific abilities, but, since these have their own growth rates, individual curves should be constructed for each.³²

³⁰ W. F. Dearborn and J. W. M. Rothney, *Predicting the Child's Development* (Sci-Art Publishers, Cambridge, Mass., 1941), p. 231.

³¹ Quoted by H. E. Jones and H. S. Conrad in N. B. Henry (ed.), *op. cit.*, p. 157. Data on pairs of testings with American Council examinations on approximately 1000 individuals between 13½ and 20 years showed substantial gains to the end of the second decade. Consult R. L. Thorndike, "Growth of Intelligence During Adolescence," *Journal of Genetic Psychology*, 1948, 72:11-15.

³² M. Sherman, *Intelligence and Its Deviations*, chap. 2.

In the light of available evidence it seems reasonable to conclude that the extreme variability in early mental growth is due mostly to immaturity. The greater stability which appears during the elementary school period may be due largely to the development of a general intellectual factor. The fluctuations which occur at adolescence probably can be accounted for not only by diminishing mental growth but also to some extent by environmental stimulation and specialization of interests.

The nature of mental growth has significant implications for the guidance of children and youth.³³ Adults who understand the course of mental development will realize that intelligence test scores, especially on preschool children, should not be taken too seriously. They should recognize that each individual has a characteristic mental growth pattern and that it may be damaging to his personality constantly to compare him with others, either favorably or unfavorably. Abilities and interests should be considered in stimulating children and youth to reasonable achievement without subjecting them to too much pressure. At adolescence, also, the recognition of special interests is important in selecting an educational program, as well as in the choice of an occupation.

HOW ARE HEREDITY AND ENVIRONMENT RELATED TO INTELLIGENCE?

When one asks why individuals differ so widely in intelligence, he may encounter two extreme points of view. One of these emphasizes heredity; the other places more emphasis upon environment. As we showed in Chapter 2, heredity and environment are integrally related, and are inseparable factors in all aspects of human development. One of the major controversies in psychology, however, has been the problem of determining how much heredity and environment each contributes to intelligence. To do this adequately it is necessary to devise techniques for holding one factor constant while the other is varied. If we wish to ascertain how environment affects intelligence, we should select individuals with similar heredity, such as identical twins, and subject them to different types of environment. Conversely, to find out the relative contributions of heredity, we should hold environmental factors constant, and note what effect these have upon individuals with varying hereditary backgrounds.

³³ N. B. Henry (ed.), *op cit*, chap. 9 by H. S. Conrad and F. N. Freeman, especially p. 180.

Obviously, in a practical sense, such control is impossible. Presumably, identical twins have the same genetic background, but we cannot be sure that *all* of their biological characteristics are identical. It is even more difficult to control environment, because so many subtle influences escape objective observation. The best we can do is to try to control some of its more tangible aspects. Despite these limitations investigations have been carried on to estimate the proportional effects of heredity and environment upon *measurable* intelligence.

Studies of identical twins reared apart³⁴ have been made in an attempt to determine how much varying home surroundings can increase or decrease intelligence. In such cases the twins usually are separated at a very early age and may be reared in radically different kinds of environments, often without a knowledge of each other's existence. Their respective cultural and educational opportunities, also, may be strikingly different. Notwithstanding these environmental inequalities, some writers have concluded from such studies that hereditary factors may account for anywhere from 70 to over 90 percent of the variability in intelligence.³⁵

However, Newman's intensive studies of identical twins reared apart indicate that where there is a marked cultural or educational advantage favoring one twin, there is a fairly consistent tendency for intelligence test scores to be higher. This is illustrated in the case of Mildred and Ruth, identical twins.³⁶ Mildred was adopted by a prominent banker and had unusual social and cultural opportunities. Ruth, on the other hand, was adopted into a home of little education where the foster father was a labor foreman. She was permitted to have few social contacts and her cultural background was meager. By the time both were seniors in high school they showed striking personality and intellectual differences. Not only did Mildred have

³⁴ B. S. Burks, "A Study of Identical Twins Reared Apart Under Differing Types of Family Relationships," in Q. McNemar and M. Merrill (eds.), *Studies in Personality, Contributed in Honor of Lewis M. Terman* (McGraw-Hill Book Company, Inc., New York, 1942), pp. 35-69; Whipple (ed.), *Intelligence: Its Nature and Nurture*, Part II, chap. 8 by H. D. Carter; H. W. Newman, *Multiple Human Births* (Doubleday and Company, Inc., New York, 1940), chaps. 12-15; A. M. Leahy, "Nature-Nurture and Intelligence," *Genetic Psychology Monographs*, 1935, 17, 235-308; A. Anastasi, *Differential Psychology* (The Macmillan Company, New York, 1937), pp. 125-129.

³⁵ J. Loevinger, "On the Proportional Contributions of Differences in Nature and in Nurture to Differences in Intelligence," *Psychological Bulletin*, 1943, 40:725-756, especially pp. 730-740.

³⁶ Newman, *op. cit.*, p. 194.

superior social poise but her intelligence quotient was 15 points higher than Ruth's.

Another instance of the effect of differences in educational advantages on the measurable intelligence of identical twins is that of James and Reece.³⁷ James went to grade and high school in a small town, while Reece attended a rural mountain school spasmodically until he reached the eighth grade, where he stopped. On an individual test of intelligence James was classified as normal with an intelligence quotient of 96, whereas Reece obtained an intelligence quotient of 77, which puts him in the borderline category between dullness and feeble-mindedness.

Newman does not claim, on the basis of these findings, that environment is more important than heredity in determining differences in intelligence. He stresses the fact that when the educational and cultural opportunities given to identical twins reared apart are approximately the same, their measurable intelligence is very similar. However, when educational and cultural opportunities are unusually good or poor for either of the twins, definite effects, either favorable or unfavorable, upon intelligence test scores generally are observed.³⁸

The method of correlation, also, has been employed to estimate the contribution of inheritance to intelligence. It is assumed that people who are related to each other are more alike than are those who are unrelated. The degree of the relationship is expressed numerically by what is known as a coefficient of correlation, designated by a small r . As we noted in a previous section, the size of this coefficient indicates roughly whether the degree of relationship is or is not significant. Applying this technique to people of eminence, Galton formulated his law of "Ancestral Inheritance." He claimed that a child inherits one-half of his traits from his parents, one-quarter from his grandparents, one-eighth from his great grandparents, etc. There is now some doubt about the validity of these numerical relationships, but the general idea underlying the law still holds true: that is, family resemblance becomes less with each succeeding generation. With respect to intelligence, therefore, children tend to resemble their parents to a noticeable ($r = .40$), but not perfect ($r = 1.00$), degree. The biological basis of inheritance is so complicated that cases occur in which this resemblance is not nearly so great.

³⁷ *Ibid.*, p. 190.

³⁸ *Ibid.*, p. 189.

Among the best-known studies purporting to measure the influence of similar environment upon children of differing heredity are those of Burks and Leahy. Burks studied the effects of certain factors, such as father's mental age, father's and mother's vocabulary, and family income, upon 164 foster children matched with 95 children reared in their own homes. When the correlations were corrected for attenuation, the coefficients were .42 for the foster children and .61 for the natural children.³⁹

A similar investigation was conducted by Leahy⁴⁰ in which even greater precautions were taken to see that there should be no relationship between the hereditary background of the foster children and the homes into which they were adopted. Correlations of .50 between natural children and their parents were secured as compared with correlations of .20 between foster children and foster parents.

These results seem to indicate that, so far as the factors measured are concerned, natural children resemble their parents more closely than foster children resemble foster parents, even though the home environments of both are approximately the same.

As we have emphasized already, *both* hereditary and environmental factors interact in the development of intelligence. The relative amount contributed by each is still a disputed question, but present evidence seems to favor heredity more than environment. In the final analysis, an individual's capacity for intelligent behavior is dependent upon the type of brain and nervous system which he possesses.⁴¹ This basic neural structure seems to be determined largely by genetic factors, although environmental conditions, even in the prenatal period, may have some effect upon it. A major difficulty in attempting to estimate the proportional contributions of heredity and environment to intelligence is that these two highly complex factors cannot be represented adequately by single statistical values. This has been well stated by Loevinger,⁴² who says: "It

³⁹ Whipple (ed.), *Nature and Nurture. Their Influence upon Intelligence, The Twenty-Seventh Yearbook of the National Society for the Study of Education* (Public School Publishing Company, Bloomington, Ill., 1928), Part I, chap. 10 by Burks; Barker, Kounin, and Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 15 by Burks, especially p. 255.

⁴⁰ *Op. cit.*

⁴¹ K. S. Lashley, "Structural Variation in the Nervous System in Relation to Behavior," *Psychological Review*, 1947, 54:325-334.

⁴² *Op. cit.*, p. 750.

must be remembered that in analyzing the proportional contributions to variance in intelligence, we do not deal with differences in mental heredity in terms of the great variety of mental qualities, but in terms of a single numerical index, and we do not deal with the environment in terms of its rich texture of subtle influences, but again only in terms of a single numerical index." She also doubts the possibility of devising a statistical method which will tell us accurately the exact amounts which heredity and environment each contributes to intelligence. Certainly, on the basis of our present knowledge we are not justified in assigning definite percentage values to represent the relative contribution of these two influences to the intelligence of *all* individuals.⁴³

SOME FACTORS AFFECTING INTELLIGENCE

Because of its complex nature there are many factors which affect the functioning of intelligence. We shall not attempt an exhaustive consideration of these, but shall note only a few of the more frequently discussed ones. These include: (1) sex, (2) health and physical development, (3) emotional and personality factors, and (4) socioeconomic status.

ARE THERE ANY SEX DIFFERENCES IN INTELLIGENCE?

The question of sex differences in intelligence is highly controversial, and the literature upon this topic is vast, although not always scientific. Several excellent summaries⁴⁴ have been made of the existing evidence from both individual and group tests of intelligence. From present data based on *total* scores it would seem that during the preschool years girls are slightly advanced over boys in general intelligence. In early childhood neither sex shows any superiority in intelligence. Girls are generally accelerated in the preadolescent years, and thereafter boys seem to be somewhat in advance until the end of the second decade. However, if the many factors which complicate test scores are considered, it is doubtful if the differences between the sexes are significant. Generalizations from some of the

⁴³ Carmichael (ed.), *Manual of Child Psychology* (John Wiley and Sons, Inc., New York, 1946), chap. 11 by H. E. Jones, especially pp. 583-585.

⁴⁴ Stoddard, *op. cit.*, chap. 10; Anastasi, *op. cit.*, chap. 15; Whipple (ed.), *Intelligence: Its Nature and Nurture*, Part I, (chap. 6 by G. M. Kuznets and Q. McNemar.

early studies were based upon inadequate statistical procedures.⁴⁵ Errors were made both in the selection of subjects to be tested and in the methods used for the comparison of results. When we consider individuals we should remember that the differences in intelligence between the sexes are less than they are within each sex. This means that the differences either among boys or among girls are greater than are those between boys and girls.

As we mentioned above, most of the generalizations about sex differences in intelligence are based on *composite* test scores rather than upon an analysis of test *items* and their proportion in the total score. When the sexes are compared from the standpoint of test content, girls tend to do better on items that are predominantly verbal, whereas boys are superior in those dealing with science, arithmetic, and mathematics.⁴⁶ These characteristics occur under such widely varying conditions and with such differing population groups that they cannot be attributed solely to chance. Certain tests which are overweighted with language items will favor the girls, while those with a disproportionate number of science and mathematical items will tend to raise the scores of boys. This difference holds not only in childhood and in adolescence, but also throughout the college years.

Another topic which has provoked heated discussion is that of the relative variability of intelligence between the sexes. There is some evidence that this variability is slightly greater among males, i.e., more extremes are found among them than among females. The histories of practically all countries show a preponderance of eminent men, and vital statistics also indicate a somewhat greater proportion of male mental defectives. It has been suggested,⁴⁷ however, that this apparent excess of feeble-minded males probably is due to errors in collecting data. It is known, for example, that mentally defective boys are more likely to be committed to custodial institutions than are girls. The undeniable existence of larger numbers of eminent men may be the result partly of differences in motivation and opportunity. Women also may be at a disadvantage because of

⁴⁵ L. S. Hollingworth, *Public Addresses* (The Science Press Printing Company, Lancaster, Penna., 1940), "Comparative Variability of the Sexes," pp. 11-16.

⁴⁶ Henry (ed.), *op. cit.*, Part I, chap. 9 by F. N. Freeman, H. S. Conrad, and H. E. Jones, Carmichael (ed.), *op. cit.*, chap. 19 by Terman.

⁴⁷ See Carmichael (ed.), *op. cit.*, p. 992.

the time which they must devote to the bearing and rearing of children, and because most cultures have encouraged them to be homemakers rather than to compete actively with men.⁴⁸

HOW DO HEALTH AND PHYSICAL DEVELOPMENT AFFECT INTELLIGENCE?

There is a widespread belief that health and physical condition have a profound effect upon intelligence. Many parents believe that the correction of physical defects, such as the removal of diseased tonsils and adenoids, will restore a mentally retarded child to normal intellectual status. There may, of course, be individual cases in which serious defects, such as blindness or deafness, result in some degree of mental retardation. We have noted, also, in Chapter 4 that physical conditions produced by the over or under secretion of certain endocrine glands may affect the functioning of intelligence. Notwithstanding these extreme instances, the general conclusion from research is that minor variations in health and physical conditions are not significant factors in mental development.

In Bayley's longitudinal study of 48 children from birth through nine years there was no evidence that mental test ratings were related to the occurrence of illness. Only a slight relationship was found to exist, too, between body build and the scores made on intelligence tests.⁴⁹

Some investigations⁵⁰ have shown a higher incidence of physical defects among children of lower intelligence. It cannot be assumed, however, that there is a causal relationship between these two conditions. Environmental differences may contribute to the situation, but it seems more probable that genetic factors are primarily responsible both for the mental retardation and for the health deficiency.

From what was said in Chapter 4 about the importance of nutrition in physical growth, it might be expected that this factor would have an important bearing upon intelligence. Within reasonable limits, however, this does not seem to be the case. When malnourished children are given an adequate diet, there is an increase in their energy, alertness, and resistance to fatigue. Interestingly enough, these improved conditions are reflected in better school

⁴⁸ Hollingworth, *op. cit.*, pp. 15 and 16

⁴⁹ Whipple (ed.), *Intelligence Its Nature and Nurture*, Part II, chap. 3 by Bayley.

⁵⁰ Carmichael (ed.), *op. cit.*, chap. 11 by H. E. Jones, especially p. 601.

achievement but not to any appreciable degree in higher mental test scores.⁵¹

The advent of sexual maturation appears to have some effect upon mental growth. Both the California and the Harvard Growth Studies⁵² show that those who mature earlier tend to make slightly higher scores on intelligence tests at this particular period of development. Late maturers, however, may show no such spurt in mental growth. It should be noted that, in general, the relationship between intellectual development and chronological age is much closer than it is between mental growth and variations in physiological maturity.

DO EMOTIONAL AND PERSONALITY FACTORS AFFECT INTELLIGENCE TEST SCORES?

The opinion is quite common that emotional disturbances in the home, and the attitude which an individual takes toward a testing situation, will affect his mental test score significantly. Bayley⁵³ made an objective appraisal of the test scores of seven children who came from broken homes, and also studied those of 15 children who, as infants, were emotionally upset during the test situation. With one exception, results obtained on children from broken homes showed that their scores at all ages adhered closely to the average for the total group.

The 15 children who were emotionally disturbed during their infant tests were given two different rating scales. One was employed at intervals during the first three years and the other at certain times after that age. In the second rating scale such personality traits were considered as cooperativeness, effort and drive, inhibition, and the ease or facility with which the child understood and performed his task. It was found that emotional disturbances at the earlier ages did not affect the child's intelligence test score adversely. There was a small positive correlation between the attitudes of the younger children and their mental test ratings, and the relationship was more significant for the older children. There is some statistical evidence that attitudes affect mental test scores, but Bayley feels that the under-

⁵¹ *Ibid.*, p. 602

⁵² *Ibid.*, pp. 604-606; Henry (ed.), *op. cit.*, chap. 9 by Freeman, Conrad, and Jones, especially pp. 167-170, Dearborn and Rothney, *op. cit.*, pp. 185-186

⁵³ Whipple (ed.), *Intelligence: Its Nature and Nurture*, Part II, chap. 3 by Bayley, especially pp. 61-66.

lying changes in growth are more important from the standpoint of the individual's intellectual development than are the minor fluctuations due to attitudes.

Another investigator,⁵⁴ working with preschool children, has shown that negativism, or the refusal to cooperate, may lower mental test scores. If tests are administered by skilled examiners who know how to adapt themselves to young children, however, the effect of negativism may be lessened. With increasing age, also, the proportion of negativistic responses decreases markedly.

Presumably, emotional and personality factors have some influence upon the individual mental test performances of older children and adolescents. The excuse that "I didn't do well on the test because I was scared and nervous" is familiar to many school and college teachers and counselors. Unfortunately, there is little scientific evidence to support such alibis, although they may be genuine in some cases. The relationship between personality factors and intelligence test scores is so complex that its objective statistical analysis is extremely difficult if not impossible, especially as age advances.

HOW DO ECONOMIC AND SOCIAL FACTORS AFFECT INTELLIGENCE?

The exact relationship between socioeconomic status and intelligence is not easy to determine. The social and economic conditions under which people live and in which children are reared are extremely complex and difficult to assess objectively. Nevertheless, scales have been developed which purport to measure certain specific socioeconomic factors, such as: the education and social activities of the parents; father's occupation and family income; number and types of magazines and books read, children's play facilities, etc.⁵⁵ It should be remembered, however, that no single scale can measure all the *subtle* influences which are found in any home environment.

There are also a number of occupational rating scales⁵⁶ on which jobs are classified into certain groups, like: professional; semiprofessional and managerial; clerical and skilled trades; semiskilled

⁵⁴ Carmichael (ed.), *op. cit.*, as quoted by Jones on p. 591.

⁵⁵ Typical examples are the Minnesota Home Status Index by A. M. Leahy, University of Minnesota Press, Minneapolis, and the Sims Score Card for Socio-Economic Status by V. M. Sims, Public School Publishing Company, Bloomington, Ill.

⁵⁶ The Tausig Scale and the Barr Scale are common examples.

and minor clerical; slightly skilled; and unskilled. More recently the government uses a particular code number to indicate each major occupational group.⁵⁷

Despite the errors inherent in these rating scales, certain general trends are revealed between the father's occupational status and intelligence stated in terms of I.Q. The figures quoted below⁵⁸ are typical of the studies showing the relationship of intelligence to father's occupation. Generally speaking the higher the occupational rating, the higher is the I.Q. for that particular class. This is true for the fathers of children at all age levels from 2 to 18 inclusive.

| Father's Occupational Classification | Mean I.Q. by Chronological Ages (years) | | | |
|---|---|-------|-------|-------|
| | 2-5½ | 6-9 | 10-14 | 15-18 |
| I Professional | 116.2 | 114.9 | 117.5 | 116.4 |
| II Semiprofessional and managerial | 112.4 | 107.3 | 112.2 | 116.7 |
| III Clerical, skilled trades, and retail business | 108.0 | 104.9 | 107.4 | 109.6 |
| IV Rural owners | 99.1 | 94.6 | 92.4 | 94.3 |
| V Semiskilled, minor clerical, minor business | 104.3 | 104.6 | 103.4 | 106.7 |
| VI Slightly skilled | 95.1 | 100.0 | 100.6 | 96.2 |
| VII Day laborers, urban and rural | 93.6 | 96.0 | 97.2 | 97.6 |

The relation of intelligence to occupational status is shown, also, in the surveys made on gifted children. Although professional groups contribute proportionately more superior children than do the non-professional groups, the latter produce more from the standpoint of actual numbers, as is seen on the next page.⁵⁹

The actual correlation between father's occupation and children's intelligence, however, is only .4. It varies, also, with the particular

⁵⁷ For an excellent treatment consult C. L. Shartle, *Occupational Information* (Prentice-Hall, Inc., New York, 1946)

⁵⁸ Reproduced from L. M. Terman and M. A. Merrill, *op. cit.*, p. 48.

⁵⁹ Consult Terman, *Genetic Studies of Genius*, Vol. I (Stanford University Press, Stanford, California, 2nd ed., 1926).

| Occupation | Percentage of Gifted Children | Occupations in General Population |
|----------------|----------------------------------|--------------------------------------|
| Professional | 29.1% | 2.9% |
| Public service | 4.5 | 3.3 |
| Commercial | 46.2 | 36.1 |
| Labor | 20.2 | 36.1 |

type of socioeconomic scale employed. Notwithstanding the fact that most of these scales claim to measure both social and economic factors, they probably put most emphasis upon social and cultural conditions. However, an economic rating, like size of income, obviously is not always a good index of intelligence. Contrast, for example, the present-day incomes of skilled and semiskilled workers with those in professional or clerical occupations. Incidentally, so far as the writers are aware, occupational scales using the new government coding have not been employed in research of this kind.

In general, however, parental intelligence and education are more closely related to the child's intelligence than is the mental status required in the father's occupation.⁶⁰

We should expect to find, therefore, that the educational and cultural differences represented by different social classes have a definite influence upon measurable intelligence. Trying to determine the extent of this influence is fully as difficult as is ascertaining the role of economic factors in intelligence. Some social anthropologists⁶¹ believe that mental tests, as now constructed, discriminate unfairly against individuals in the lower social classes. If this were true, the results of studies showing the relationship of social status to intelligence would be worthless, because the fundamental principle underlying the measurement of intelligence would be violated. This principle presupposes that *all* individuals taking tests have had equal chances to learn the simple tasks required. It is assumed further that where environmental opportunities penalize the individual examined, test results are not to be taken seriously and should be supplemented by other personal data.

That some intelligence tests, both verbal and nonverbal, administered either individually or to groups, actually are unfair to the lower social classes is indicated by data being gathered at the Uni-

⁶⁰ Whipple (ed.), *Intelligence: Its Nature and Nurture*, chap. 5, by Loevinger, especially p. 202

⁶¹ W. A. Davis and R. J. Havighurst, "The Measurement of Mental Systems (Can Intelligence Be Measured?)," *Scientific Monthly*, 1948, 66:301-316.

versity of Chicago.⁶² This is a serious matter, if, as is claimed, 60 percent of all Americans grow up in these classes. In a typical town of 115,000 population called "Mid-western City," all children 9, 10, 13, and 14 years of age were given a variety of intelligence tests. The children were grouped, also, into five social classes, using the criteria developed by Warner.⁶³ An analysis of test results showed that discrimination against the lower social classes was much greater on some tests than on others. This was particularly true on verbal scales, especially with regard to vocabulary. A lower-class child, for example, would be penalized by the following item⁶⁴ because he has probably never heard the words "banquet" and "repast."

Which of the following words mean nearly the same as dinner?

() hotel () summer () banquet () clatter () repast.

Even on a so-called nonverbal test it was found that 73 out of 80 items discriminated against children from the lowest classes.

A practice experiment was conducted upon 516 of the pupils who were divided equally between the highest and the lowest social groups. It was found that increased motivation decreased the attainment of the upper classes on intelligence tests but improved that of the lower classes. Practice alone helped the upper classes but did not aid the lower classes. The method of administration also had an important influence on the results. Those in the lower classes did much better when the tests were given orally. It was felt, too, that the upper classes were at an advantage because reading was emphasized in the home, and academic achievement was encouraged. In contrast to this, the lower-class family does little if any reading and does not regard it as important in everyday living. There is considerable evidence, also, that children living in isolated communities⁶⁵ do not have an opportunity to acquire the experiences which mental tests take for granted. It seems clear, therefore, that differences in motivation, varying methods of test presentation, and differences in cultural patterns and standards may have a marked effect upon intelligence test scores.

⁶² *Ibid.*

⁶³ Consult W. L. Warner and P. S. Lunt, *The Social Life of a Modern Community* (Yale University Press, New Haven, Conn., 1941).

⁶⁴ From Davis and Havighurst, *Father of the Man* (Houghton Mifflin Company, Boston, 1947), p. 115.

⁶⁵ Read C. Lewis, *Children of the Cumberland* (Columbia University Press, New York, 1946), especially p. 152.

A consideration of the relationship between socioeconomic status and mental ability raises again the problem of the relative contributions of heredity and environment to measurable intelligence. Some optimistic sociologists may claim that the findings indicate that differences in intellectual attainment result primarily from cultural inequalities. According to this view, if individuals of all classes are given equal opportunities, those in the lower groups will show substantial improvement on intelligence tests. Even if this is true, it does not follow that actual mental ability would be increased. We must remember that there are wide variations in measurable intelligence *within* social classes, where the general educational and cultural opportunities are quite similar. Evidently, something in addition to these opportunities helps to determine mental ability. In American culture, also, social mobility is possible, i.e., persons may move from one social class to another. The fact that some individuals do succeed in moving from lower to higher classes, while others do not, seems to be evidence of superior motivation and ability even though these qualities may not be fully appraised by existing intelligence tests.

HOW IS INTELLIGENT BEHAVIOR MEASURED?

One of the most important contributions of psychology has been the development of methods for the measurement of intelligent behavior. It is not our purpose to enter into a detailed discussion of the historical background of the testing movement.⁶⁶ Instead, we shall begin with the advent of the first practical mental tests. This will be followed by an explanation of the various types of tests and their value in everyday situations.

WHEN DID MENTAL MEASUREMENT BEGIN?

For all practical purposes individual intelligence testing began with the French psychologist, Alfred Binet. He had been experimenting for some time with the measurement of individual differences in mental ability. This work culminated in 1904 when he was asked by the Paris school authorities to select candidates for special classes intended for mentally defective children. In 1905 he and Simon, a physician, produced jointly their first rough scale of 30

⁶⁶ Consult H. E. Garrett, *Great Experiments in Psychology*, chaps. 1 and 2; Freeman, *op. cit.*, chaps. 1-7.

tests which they arranged in order of increasing difficulty. Twenty of these items⁶⁷ are as follows:

1. Follows a moving object with the eyes
2. Seizes a block and carries it to mouth when stimulated tactually
4. Discriminates between piece of chocolate and piece of wood
6. Carries out simple commands and imitates simple gestures
7. Names parts of body and familiar objects
8. Locates certain objects in pictures upon request
9. Names designated objects in picture
10. Tells which of two lines is longer
11. Repeats 3 digits
14. Defines objects
15. Repeats certain sentences
16. Tells difference between two objects: a fly and butterfly, etc.
17. Repeats from memory objects in a picture exposed for 30 seconds
18. Draws designs from memory
20. Tells how two objects are alike
24. Finds rhymes for a given word
26. Makes a sentence when given 3 words
27. Comprehends 25 questions of increasing difficulty
28. Reverses hands of clock from memory
30. Defines certain abstract terms

A revision of these tests appeared in 1908 wherein the items were classified into age groups from 3 through 13 years. The number of items also increased from 30 to 59. The following⁶⁸ are excerpts from this scale for ages 3 and 13:

Age 3

1. Points to nose, eyes, and mouth
2. Repeats short sentences
3. Repeats 2 digits
4. Enumerates objects in pictures
5. Knows last name

Age 13

1. Paper cutting
2. Reversed triangle
3. Differences between pairs of abstract terms

⁶⁷ Adapted from R. Pintner, *Intelligence Testing. Methods and Results* (By permission of Henry Holt and Company, publishers, New York, 1923), pp. 94-95.

⁶⁸ *Ibid.*, pp. 96-98.

This 1908 scale represents the first real attempt to evaluate intelligence in terms of mental age, designated as M.A., although the idea of a mental age had been suggested by Esquirol as early as 1828. Each item correctly answered gave the individual credit for a certain number of months of mental age. These, when added together, were expressed as so many years and months of mental age and were used to represent the individual's level of intelligence. By comparing total mental age with chronological or actual age it could be shown if a child was retarded or accelerated mentally. For example, if the M.A. was five years and two months and the actual age was eight years and four months, a retardation of three years and two months would be indicated. On the other hand, if the M.A. was nine years and six months and the individual was only five years and three months old, an acceleration of four years and three months would be shown.

The last revision, known as the 1911 Scale, appeared shortly before Binet's death and is an extension and rearrangement of the previous scales. The tests in this revision⁶⁹ begin with age 6 and continue for each age group through year 10. These are followed by tests for years 12, 15, and adult, intervening age groups being omitted.

Dr. Henry H. Goddard is responsible for having had the 1908 and 1911 scales translated and adapted to American conditions. Translations, revisions, and adaptations appeared in other countries also, and it has been estimated⁷⁰ that 80 or more revisions in all have been published.

Several adaptations other than the Goddard Revision became well known in the United States, but none was so extensively used as the Stanford Revision by Lewis M. Terman published in 1916. This scale⁷¹ contained 90 items arranged in continuous age groups from 3 to 10. Thereafter, tests were provided for alternate years through age 18 or "superior adult" level. Certain items were added, particularly at the upper age levels, others were eliminated, and still others were shifted from one age group to another. Scoring and administration were made more definite in an attempt to secure greater uniformity of procedure among examiners. This scale represents the first attempt to utilize the intelligence quotient or I.Q. as a predictive

⁶⁹ *Ibid.*, pp 101-102.

⁷⁰ This information was obtained from G. H. Hildreth, who has published several comprehensive test bibliographies.

⁷¹ Terman, *The Measurement of Intelligence*, Part II.

measure of intelligence, although the idea of such an index had been suggested in 1912 by the late William Stern.⁷² The I.Q. is a ratio between the mental age and the chronological or actual age. It is obtained by dividing the mental age, reduced to months, by the chronological age in months, and then multiplying by 100 to eliminate the decimal point. Thus, the formula for computing an I.Q. is:

$$\frac{\text{M.A.}}{\text{C.A.}} \times 100 = \text{I.Q.}$$

To illustrate: the I.Q. of a child whose mental age is 6 years and 4 months (76 months) and whose chronological age is 4 years and 6 months (54 months) is 141. In the same way, a child who is 11 years and 5 months old (137 months) and who has a mental age of 9 years and 2 months (110 months) will have an I.Q. of 88. In figuring I.Q.'s it should be noted that where the decimal is greater than 0.5 it is counted as the next whole number, and if it is less than 0.5 it is disregarded. It will be recalled from our discussion of mental growth that, owing to the slackening of intellectual development in adolescence, chronological ages are held constant at 15 or 16 in computing adult I.Q.'s. Consequently, in finding the I.Q. of a 30-year-old individual, his chronological age would be considered as 16 years on the 1916 Stanford Revision and as 15 years on the newer 1937 revision, which will be discussed presently.

In addition to the I.Q., other methods, such as percentile ranks, also known as centiles, and standard scores, are being used increasingly to evaluate performance on intelligence tests. A percentile score shows an individual's relative rank in a theoretical group of 100. Thus, a percentile score of 90 would mean that the individual is exceeded by only 10 percent of his group. A percentile score of 50 represents average performance, while a percentile score of 25 signifies that the individual is in the lower quarter of his group. This score is helpful in comparing data from different types of tests, because all can be reduced to a common denominator. It should be emphasized, however, that the differences between percentile scores around the middle of the group are much less significant than are those at the upper or lower levels. For example, the differences between percentile ranks of 90 and 95 are much more significant than are the differences between percentile ranks of 50 and 55. Statistically, the

⁷² Stern, *op. cit.*, pp. 41 and 42. (He called it a mental quotient.)

standard score has certain advantages over the percentile score and is preferred by some research workers. It may be defined as "a subject's rating in terms of his deviation from the mean average of the group with which he is compared. For example, if a thousand unselected ten-year-old children have a mean raw score of 120 points on a given test, and the standard deviation of the raw-score distribution for the group is 20, a subject's raw score of 140 becomes a standard score of +1; a raw score of 160 becomes standard score +2, etc."⁷³

WHAT ARE SOME OF THE MORE RECENT INDIVIDUAL INTELLIGENCE TESTS?

One of the latest revisions⁷⁴ of the Binet-Simon scale appeared in 1937 and is the work of Terman and Merrill after years of careful research. It was designed to meet the criticisms of the 1916 Scale and is now available in two forms ("L" and "M") which are equivalent in value but whose content is different. This makes it possible to retest an individual within a short period of time without incurring the effects of practice which result when the same form of the test is repeated. The scale ranges from the age of two years through three superior adult levels, and contains 129 test items. These are arranged in half-year groups between ages two and six to permit a more accurate appraisal during the preschool period when development is so rapid. Subsequently, there are tests for *every* year group through age 18. The phrase "average adult" is used to describe the tests at the 15-year level, while those at ages 16, 17, and 18 are referred to respectively as "Superior Adult I, II, and III." Materials for this scale are shown in Figure 47.

When figuring an I.Q. on children between the ages of 13 and 16, one month is dropped in every three of chronological age⁷⁵ For example, the child whose chronological age is 15 years and 1 month and whose mental age is 9 years and 10 months has an I.Q. of 68. If his actual age were used, his I.Q. would be 65. In order to facilitate the calculation of the I.Q. the examiner is furnished with tables so that no error can be made.

⁷³ Terman and Merrill, *op cit*, p. 27; see also D. M. Johnson, "Applications of the Standard-Score IQ to Social Statistics," *Journal of Social Psychology*, 1948, 27 217-227.

⁷⁴ Terman and Merrill, *op cit*, Parts II and III

⁷⁵ *Ibid*, pp 30-31, McNemar, *The Revision of the Stanford-Binet Scale*, p 10.

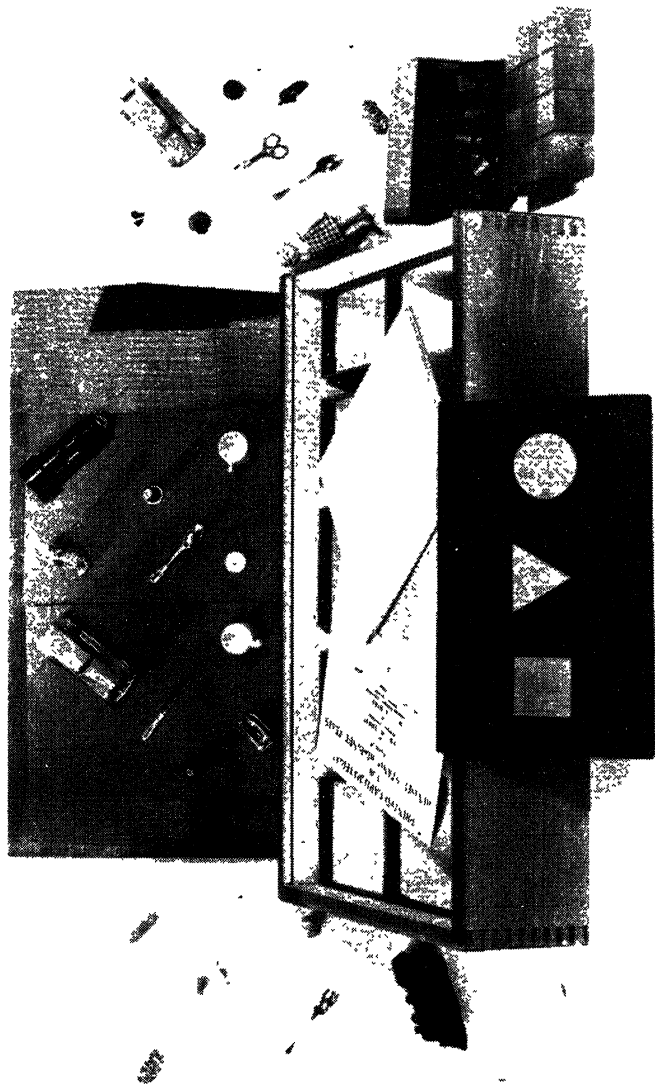


FIG. 47. Materials Used with the Terman-Merrill Revision of the Binet-Simon Intelligence Scale. (Equipment is used with *Measuring Intelligence*, by L. M. Terman and M. A. Merrill. Reproduced by permission of Houghton Mifflin Company, publishers.)

Because the Terman-Merrill Revision of the Binet-Simon Scale is suited best for measuring the intelligence of children between 6 and 12 years of age, other individual scales have been designed, especially for preschool children and more recently for adolescents and adults.

Representative of the scales for measuring the intelligence of infants and young children are those by P. Cattell, and Goodenough and Maurer. In 1940 Cattell published her scale based upon the 1929 Gesell infant tests.⁷⁶ It contains five regular test items and one or two alternates for each age level from 2 months through 30 months. The age groupings are by one-month intervals for the first year, two-month intervals for the second year, and three-month intervals for as far as the tests go in the third year. An advantage of this scale is that it can be used as a downward extension of Form L of the Terman-Merrill tests. Cattell claims that the tests at 6, 9, and 12 months have the highest reliability, and that the scale has its greatest predictive value after 18 months.⁷⁷ The following are examples of test items used at 2, 12, and 30 months.

2 Months

1. Attends to voice
 2. Inspects environment
 3. Follows ring in horizontal motion
 4. Follows moving person
 5. Babbles
- Alternate: Follows ring in vertical motion
Alternate: Lifts head in prone position

12 Months

1. Beats two spoons together
 2. Places one cube in cup
 3. Marks with pencil
 4. Rattles spoon in cup
 5. Speaking vocabulary: two words
- Alternate. Hits doll

30 Months

1. Differentiates bridge from tower
2. Imitates drawing lines and circles

⁷⁶ P. Cattell, *The Measurement of Intelligence of Infants and Young Children*. (Test items reproduced by courtesy of the author and of the publisher and distributor of the tests, The Psychological Corporation, New York.)

⁷⁷ *Ibid.*, p. 51.

3. Stanford-Binet Three-Hole Formboard rotated
4. Folds paper (Merrill-Palmer)
5. Stanford-Binet Identifying Objects by use
Alternate: Identifies pictures from names
Alternate: Concept of one

The Minnesota Preschool Tests published in 1942 are intended for children between the ages of 18 months and 6 years. The tests are arranged in three scales: verbal, nonverbal, and a combination of verbal and nonverbal. Tables are presented for interpreting scores in terms of I.Q. Equivalents. Some representative test items for different ages are:⁷⁸

1. Pointing out parts of the body on a doll
2. Response to pictures
3. Discrimination of forms (designs)
4. Naming colors
5. Picture puzzles
6. Incomplete pictures
7. Absurdities
8. Paper folding
9. Giving word opposites
10. Imitating position of clock hands

Some of the materials used in these scales are shown in Figure 48.

Probably the best individual intelligence test developed thus far for adolescents and adults is the Wechsler-Bellevue.⁷⁹ This test was published in 1939 and its latest revision appeared in 1944. The tests included are:⁸⁰

1. An Information Test (25 questions)
2. A General Comprehension Test (10 questions and 2 alternates)
3. A Combined Memory Span Test for Digits Forwards and Backwards (repeating series of 3 to 9 numbers forwards and 2 to 8 backwards)
4. A Similarities Test (12 pairs of words)
5. An Arithmetical Reasoning Test (10 problems)
6. A Picture Arrangement Test (6 pictures)

⁷⁸ Reproduced by courtesy of the Educational Test Bureau, Philadelphia. A complete description of the scale will be found in F. L. Goodenough and K. M. Maurer, *The Mental Growth of Children from Two to Fourteen Years* (University of Minnesota Press, Minneapolis, 1942). Read chap. 3 especially.

⁷⁹ D. Wechsler, *The Measurement of Adult Intelligence*.

⁸⁰ *Ibid.*, chap. 7. (Reproduced by permission of The Williams and Wilkins Company, Baltimore, publishers.)

7. A Picture Completion Test (15 pictures)
8. A Block Design Test (7 designs)
9. An Object Assembly Test (manikin, profile, hand)
10. A Digit Symbol Test (associating 67 numbers with certain marks)
Alternate. A Vocabulary Test (42 words)

The above tests can be used as four separate scales.⁸¹

- I Individual Adult Examination for ages 16 to 60 (using 7 or 10 of the above tests)
- II Adolescent Scale for ages 10 to 16 (using the same tests but standardized separately)
- III Performance Scale (where language is minimized) using tests 6 to 10 inclusive
- IV Verbal Scale, using tests 1 to 5, and the vocabulary as an alternate

Wechsler objects to the I.Q. formula used by Terman because he does not believe that there is a constant relationship between mental age and chronological age. In his method of computing I.Q.'s he used the following:⁸²

$$\text{I.Q.} = \frac{\text{Attained or actual score}}{\text{Expected mean score for age}}.$$

That is, an I.Q. "is the ratio between a particular score which an individual gets (on a given intelligence test) and the score which an average individual of his life age may be assumed to attain on the same test, when both scores are expressed in the same notation (e.g., in terms of months and years)." Tables of I.Q.'s are provided for the different age levels of the scale. This method of computing I.Q.'s has been criticized,⁸³ because it assumes an arbitrary zero point in mental ability which actually does not exist.

WHAT ARE SOME NEWER TYPES OF GROUP TESTS?

With the increasing use of individual intelligence tests two objections became apparent. (1) the amount of time required to administer them; and (2) the amount of training necessary to give and interpret them correctly. An attempt to meet these criticisms was the development of group intelligence tests, enabling large numbers of individuals to be tested at the same time by anyone capable of following instructions carefully.

⁸¹ *Ibid*, p. 77.

⁸² *Ibid*, p. 24.

⁸³ McNemar, *The Revision of the Stanford-Binet Scale*, pp 11 and 12.

The experimentation and wholesale testing of 1,750,000 recruits by American psychologists during the First World War is responsible for the rapid growth of the group test and the testing movement in general. Later, severe criticisms were directed against intelligence tests, because of their abuse and misinterpretation by "testers" who were not properly qualified. Notwithstanding these criticisms, the usefulness of the group test was so evident from the Army's experience with it that numerous other tests soon were developed. They have been widely used in schools and colleges as aids in the classification of students and in the evaluation of achievement. During the Second World War extensive psychological testing was carried on in the armed forces both for the purposes of general classification and for the discovery of special aptitudes. In the Army alone 8,000,000 men were given the Army General Classification Test, known as A.G.C.T.⁸⁴ The speed with which large numbers of individuals can be examined has been increased further by the use of machine scoring. Tests are marked with electrolytic pencils and when placed in an electric scoring machine are registered instantaneously on a dial.

Many satisfactory group tests of intelligence now are available for all age levels. Obviously, we cannot mention all of these tests, but we shall consider a few of the more recent ones which have some special feature.

The California Test of Mental Maturity,⁸⁵ published first in 1936 and revised several times since, introduced an innovation in group intelligence tests by utilizing a "diagnostic profile." This enables the examiner to analyze those mental abilities which are basic to school success. The mental capacities included are classified according to four general categories: "memory," "spacial relationships," "reasoning," and "vocabulary." In addition to the usual type of I.Q., it also yields a language and a nonlanguage I.Q. These tests are available for age levels ranging from kindergarten to adult.

Primary Mental Abilities (1946) have been developed by the Thurstones⁸⁶ to measure five of the eight primary mental abilities

⁸⁴ W. V. Bingham, "Personal Classification Testing in the Army," *Science*, 1944, 100:275-280.

⁸⁵ Devised by E. T. Sullivan, W. W. Clark, and E. W. Tieg (California Test Bureau, 5916 Hollywood Boulevard, Hollywood 28, California)

⁸⁶ Science Research Associates, 228 South Wabash Avenue, Chicago 4, Illinois.

of which they believe intelligence is composed. For ages five and six these factors are: "verbal meaning," "perceptual-speed," "quantitative," "motor," and "space." For ages 11 to 17 the "five separate areas of intelligence" measured are: "verbal meaning," "word fluency," "reasoning," "number," and "space." Results, also, are expressed in profile form as illustrated on page 223.

The American Council on Educational Psychological Examinations⁸⁷ (A.C.E., 1924) also were developed by L. L. Thurstone and T. G. Thurstone. They are designed for high school students and college freshmen, and new forms are published each year. They include tests in arithmetic, analogies, and number series which yield a *Q* score; and completion, artificial language, and same-opposite tests which give an *L* score. The *gross* score is a combination of the *Q* and *L* scores. This test is diagnostic to some extent, since mathematical and scientific abilities are indicated by the *Q* score, whereas language facility is represented by the *L* score.

The Army General Classification Test (1941-1946) devised by a Committee on Classification of Military Personnel and a large staff of Army psychologists is now obtainable for civilian use.⁸⁸ It was taken by 10 million men during the Second World War, and its purpose was "to indicate the rate at which each individual soldier might be expected to absorb training and the level of difficulty of the material he should be capable of mastering."⁸⁹ It is regarded as a combination test of both intelligence and achievement, and forms for both literates and illiterates have been constructed. The content of the literate form is primarily verbal, arithmetical, and spatial. Results are interpreted in terms of standard scores from which the five classifications are derived as follows:⁹⁰

| Army Grade | A.G.C.T. Score |
|------------|----------------|
| I | 130 or higher |
| II | 110 to 130 |
| III | 90 to 110 |
| IV | 70 to 90 |
| V | 50 to 70 |

⁸⁷ Distributed by American Council on Education, 744 Jackson Place, Washington 6, D.C.

⁸⁸ Science Research Associates.

⁸⁹ Bingham, "Inequalities in Adult Capacity—From Military Data," *Science*, 1946, 104:147.

⁹⁰ *Ibid.*, pp. 147-152.

Material is available at present which makes it possible to interpret A.G.C.T. scores in relation to success in various professions and other occupations.⁹¹

WHAT ARE PERFORMANCE TESTS?⁹²

The majority of the items included in both individual and group tests of intelligence are verbal in nature. This tends to penalize the individual who comes from a home where a foreign language is spoken, or one whose language development has been retarded by living in an isolated environment, by deafness, or by some other

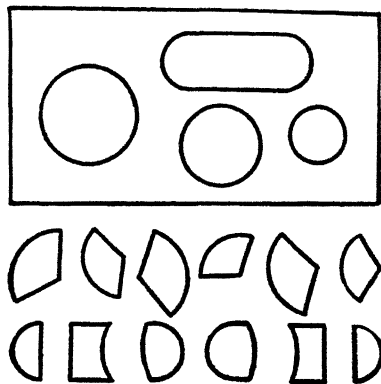


FIG. 49. The Casuist Form Board (From A. F. Bronner, W. Healy, G. M. Lowe, and M. E. Shmberg, *A Manual of Individual Mental Tests and Testing*, Little, Brown and Company, Boston, 1927. By permission of Dr. William Healy. This test is sold by C. H. Stoelting Company, 424 N. Homan Avenue, Chicago 24, Ill.)

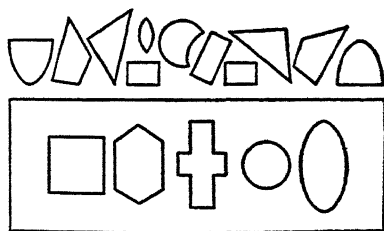


FIG. 50. The Five Figure Board. (From A. F. Bronner, W. Healy, G. M. Lowe, and M. E. Shmberg, *A Manual of Individual Mental Tests and Testing*, Little, Brown and Company, Boston, 1927. By permission of Dr. William Healy. This test is sold by C. H. Stoelting Company, 424 N. Homan Avenue, Chicago 24, Ill.)

⁹¹ N. Stewart, "A G C T. Scores of Army Personnel Grouped by Occupation," reprinted from *Occupations, the Vocational Guidance Journal*, October, 1947.

⁹² Yoakum and Yerkes, *Army Mental Tests* (Henry Holt and Company, New York, 1920), pp. 276-291; R. Pintner and D. G. Paterson, *A Scale of Performance Tests* (Appleton-Century-Crofts, Inc., New York, 1917), A. F. Bronner, W. Healy, G. M. Lowe, and M. E. Shmberg, *A Manual of Individual Mental Tests and Testing* (Little, Brown and Company, Boston, 1927), chaps. 6 and 12, G. Arthur, *A New Point Performance Scale* (Commonwealth Fund, New York, 1930) Also G. Arthur, *A Point Scale of Performance Tests*, Revised Form II, 1947. (These tests are sold by The Psychological Corporation, 522 Fifth Avenue, New York 18, N.Y.)

cause. To meet such situations so-called performance tests, which minimize language, were devised as early as 1911. In general, these include three types: (1) geometrical forms, (2) picture puzzles, and (3) mazes. In the first of these the subject is required to match

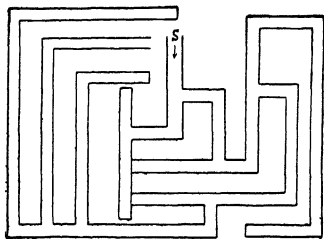


FIG 51 The Porteus Maze. (From A. F. Bronner, W. Healy, G. M. Lowe, and M. E. Shmberg, *A Manual of Individual Mental Tests and Testing*, Little, Brown and Company, Boston, 1927. By permission of Dr. William Healy. This test is sold by C. H. Stoelting Company, 424 N. Homan Avenue, Chicago 24, Ill.)

geometrical forms with frames bearing the same general outlines as the insets. In the picture puzzles certain objects are omitted and a number of uniform-sized blocks are supplied, each bearing a picture which might be used. Some, however, are more suitable than others, and hence receive higher scores. Paper and pencil, or finger mazes are used to test one's ingenuity in finding his way through simple or complicated labyrinths without getting into "blind alleys." The scores on all these performance tests usually may be interpreted in terms of mental age and are helpful supplements to tests of the verbal type, even for those without

apparent language handicaps (see Figs. 49-52). Certain of these performance tests have been combined into scales. The first of these was standardized by Pintner and Paterson on children 4 to 15 years of age. More recently, a revised form of the *Arthur Point Scale of Performance Tests* has appeared, standardized on individuals 5 to 15 years of age.

*The Goodenough Draw-A-Man Scale*⁹³ is another type of performance test which is a valuable addition to existing measurements for preschool children. Although the scale is intended to cover the period from 3 to 13 years, it is not well suited to the older individual because school instruction affects the score. In this test the child is instructed "to make a picture of a man," and is told to do his best. His performance is then evaluated on the basis of the number of ideas expressed in the drawing rather than upon artistic appearance, motor coordination, or mechanical skill. The results are interpreted

⁹³ Goodenough, *Measurement of Intelligence by Drawings* (World Book Company, Yonkers, 1926).

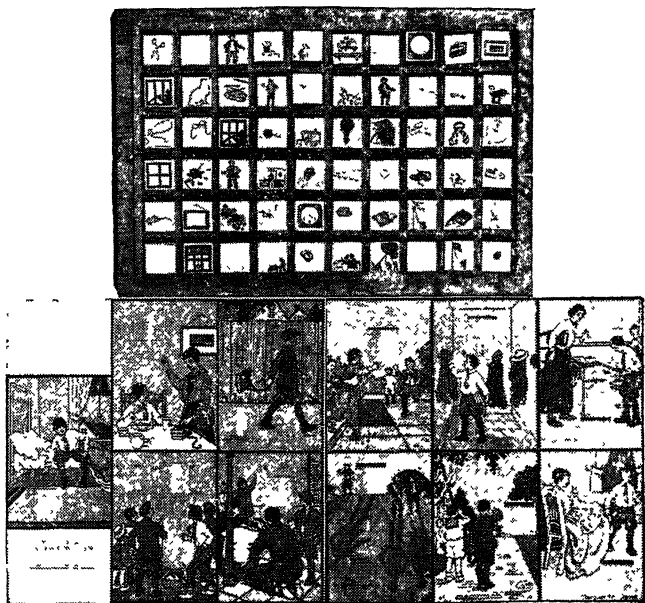


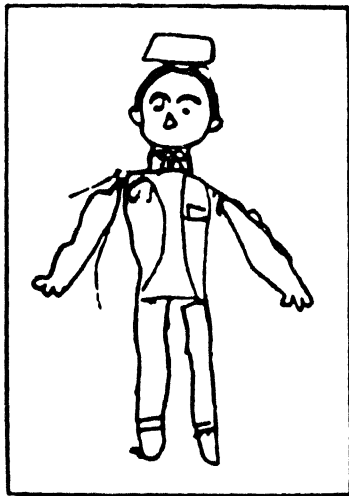
FIG 52 The Healy Picture Completion Test II. (From A. F. Bronner, W. Healy, G M Lowe, and M E. Shimberg, *A Manual of Individual Mental Tests and Testing*, Little, Brown and Company, Boston, 1927 By permission of Dr. William Healy. This test is sold by C. H. Stoelting Company, 424 N. Homan Avenue, Chicago 24, Ill.)

in terms of mental age, and an I.Q. can be calculated if the child's exact age is known. See Figures 53 and 54 for sample drawings.

Figures 53 and 54 show two drawings. The picture on the left is that of a man drawn by a white girl aged five years and seven months. Her mental age on this scale is exactly five years, hence her I.Q. is 90. The picture on the right was drawn by a Negro girl whose chronological age is 12 years and 6 months. Her mental age is eight years and nine months, so her I.Q. is 70.

WHAT KINDS OF ITEMS ARE USED IN INTELLIGENCE TESTS?

The question is often asked as to what kind of performances are used to gauge intelligence. It is unnecessary to give a complete list here, but a short description of some of the more valid or widely used items will suffice.



FIGS 53 and 54. The Goodenough Draw-A-Man-Test. (Reproduced by special permission from *Measurement of Intelligence by Drawings* by F. L. Goodenough. Copyright by World Book Company.)

For the child of preschool age⁹⁴ items involving sensory and motor development predominate because of the close relationship between physical growth and the development of mental function. Simple tests used with children one year of age or under include such things as: eye coordination in either a vertical or a horizontal plane; winking at objects brought suddenly close to the child's face; looking at, grabbing, or manipulating objects placed before him, as spoons, cups, cubes, etc.; looking for objects which have disappeared from view; imitating simple movements; and performing simple actions upon request.

Older children of the preschool age are required to recognize, point out, or enumerate objects in pictures; to obey simple verbal commands; to copy a circle or square; to discriminate or match forms of various shapes, as circles, squares, triangles, or pictures of common objects; to identify pictured objects and actions; to repeat easy, short sentences; to count four objects, to name different parts of the body;

⁹⁴ A. Gesell and H. Thompson, *The Psychology of Early Growth* (The Macmillan Company, New York, 1938), p. 257, L. C. Wagoner, *The Development of Learning in Young Children* (McGraw-Hill Book Company, Inc., New York, 1933); R. Stutsman, *Mental Measurement of Preschool Children* (World Book Company, Yonkers, 1931), chap. 6.

to nest cubes; to build towers and gates with blocks, and to fit together various types of picture puzzles.

The following items seem to be significant in evaluating the intelligence of school-age children and adults:⁹⁵

1. *Analogies*. The individual is to ascertain certain relationships between objects, geometrical figures, or qualities. For example, "Glove is to hand as ? is to foot?" (shoe), "Good is to poor as beauty is to?" (ugliness).

2. *Opposites*. Naming or marking the opposite meaning of a word from among a number of words. An example of such an item is:

"Small _____ round size little *big*"

3. *Comprehension questions*. These require the understanding of certain problem situations, as: "What is the thing to do if you are sick?"

4. *Vocabulary*. The understanding of terms may be checked (a) through the picturing of objects or situations for young children, (b) by asking children to name objects as they are shown, or (c) by asking the subject to define a standard set of words.

5. *Similarities and differences*. The ability to detect similarities or differences, or both, between objects has long been used. For example, "In what way are a peach and a pear alike?" "What's the difference between stone and glass?" "In what way are a cow and a horse alike, and in what way are they different?"

6. *Completion items*. Verbal and pictorial completion items are used in a variety of ways. The individual may be asked to mark the missing parts in drawings of objects, people, or designs; or a sentence may be read in which it is necessary to insert a key word in the proper blank.

7. *Absurdities*. The ability to detect absurdities may appear either pictorially or verbally. That is, the subject may be asked to point out in a picture something which is foolish, or to detect a particular statement which does not make good sense. For instance, a picture of a man feeding an apple to an infant which has no teeth may serve to illustrate such an item, or a statement such as. "A woman rushed to the tram caller and inquired: 'When does the eight o'clock train leave?' "

8. *Deferred memories*. One example of such an item is the task of drawing designs from memory. The individual is shown two designs and is then told that he will be asked to reproduce them after a certain number of seconds have elapsed.

A variation of this test item is found where the subject is told to look carefully at certain pictured objects or designs. At a given signal he is

⁹⁵ Consult Terman and Merrill, *op cit*, p. 7. The writers have not knowingly cited here an *actual* test item but have used what they consider parallel examples for illustrative purposes only.

asked to turn to a page where he is to mark those he has seen from among a number of different objects or designs.

9. *Memories from meaningful material* These may be measured (a) by asking the subject to read a passage, either silently or orally, and to tell all he remembers, or (b) by reading a paragraph aloud to him and asking him to underscore the correct memories from among several incorrect ones.

10. *Mechanical memories.* The repetition of a standard series of digits, either forwards or backwards, or of words and sentences represents attempts to measure rote or mechanical memories.

WHAT DOES THE I.Q. MEAN?

The use of the term "I.Q." has become commonplace, yet many persons do not understand fully its meaning and its implications. To interpret I.Q.'s correctly one must know how constant or reliable they are and the degree of mental capacity which they signify. One should know, also, how frequently I.Q.'s of different magnitudes occur in the general population.

We have seen that mental age indicates an individual's mental level, i.e., it provides a rough estimate of his mental capacity at the time a test is given. The I.Q., on the other hand, is a predictive measure, which tells what can be expected mentally of an individual in the future. Obviously, the predictive value of an I.Q. depends upon its constancy. If we find, for example, that a child has a normal I.Q. at six years of age, under ordinary circumstances he should still be normal later on. If he rates as superior or dull he should maintain that rating.

IS THE I.Q. CONSTANT?

This practical question often arises when it is necessary to retest children, or when a child of preschool age is examined and it is of vital importance to know whether his I.Q. will remain about the same when he becomes older, as in cases of adoption.

From the data which we have at the present time Bayley feels that the infant tests available give only rough approximations of intelligence.⁹⁶ This is confirmed by Honzik, who says: "Results suggest the impossibility of making an accurate prognosis of future ability on

⁹⁶ Bayley, "Mental Growth During the First Three Years: A Developmental Study of Sixty-One Children by Repeated Tests," *Genetic Psychology Monographs*, 1933, 14.83-85.

the basis of a single mental test given before the age of two, but suggest further that repeated tests and tests at later ages of the pre-school span have increasing predictive value."⁹⁷ In a later study Bayley states that "prediction in the grade school from tests given at four years of age may be possible within wide classifications for most of the children (r = about .75). Tests given between 2 and 4 years will predict eight- and nine-year performance with less success (r = about .55), while scores made before 18 months are completely useless in the prediction of school-age abilities."⁹⁸ In general, Bayley's conclusions are supported by the findings of other investigators.

On the 1937 Terman-Merrill Scale it has been found that changes in I.Q. for children between 6 and 13 years of age are 2.8 points for low I.Q.'s and 5.3 points for high I.Q.'s.⁹⁹ This means that the I.Q. is more accurate in cases below 70 (feeble-minded) and is less accurate for those exceeding 130 (very superior). During the school period some changes in I.Q. may be due to differences in interest and effort and to variations in the emotional stability of the child. Much caution should be exercised, therefore, in predicting a child's ability.

As we have stated already, the I.Q. is unsatisfactory as an index to brightness after adolescence because of the slowing down of mental growth and the development of special interests and abilities. We should not expect, therefore, that the I.Q. would be very reliable during this period.

We have stressed repeatedly that many factors affect the I.Q. In addition to age and degree of brightness, we have seen that extremes in environment, the individual's motivation and emotional stability, also, may have considerable influence on it. The entire question as to the constancy of the I.Q. has been the subject of much controversy, and a great amount of literature has been accumulated on this topic.¹⁰⁰ On the one hand, some writers have claimed that favorable

⁹⁷ M. P. Honzik, "The Constancy of Mental Test Performance During the Pre-School Period," *Journal of Genetic Psychology*, 1938, 52:285-302.

⁹⁸ Whipple (ed.), *Intelligence: Its Nature and Nurture*, Part II, pp. 17-18.

⁹⁹ McNemar, *op. cit.*, p. 166

¹⁰⁰ Consult. Whipple (ed.), *Addresses and Discussions Presenting the Thirty-Ninth Yearbook* (printed by Newcomb and Gauss, Salem, Mass., 1940); McNemar, "A Critical Examination of the University of Iowa Studies of Environmental Influences upon the I.Q.," and B. L. Wellman, H. M. Skeels, and M. Skodak, "Review of McNemar's Critical Examination of Iowa Studies," *Psychological Bulletin*, 1940, 37:63-92, 93-111; R. L. Thorndike, "Constancy" of

environmental conditions may produce rather spectacular changes in I.Q., while on the other hand, critics have challenged the validity of such findings.

We hesitate to make sweeping generalizations concerning this controversial issue, especially in the case of preschool children, of adolescents, of particularly bright individuals, or of those from seriously underprivileged environments. Nevertheless, we believe that the I.Q. is roughly constant if derived from individual tests given by a competent examiner under average conditions to school-age children having approximately the same background of experience. While minor fluctuations in the I.Q. may occur, usually they are not great enough to change the subject's mental classification. That is, the dull tend to remain dull, the average tend to remain average, etc. A knowledge of the way in which I.Q.'s are classified, therefore, is important if their variations are to be interpreted correctly.

HOW ARE I.Q.'s CLASSIFIED?

In order to interpret the value of an I.Q. several classifications are used, and two of the better-known ones are listed here. Woodrow's classification of I.Q.'s is as follows:¹⁰¹

| I Q. | Classification |
|----------------|--|
| Above 140 | Genius or near genius |
| 120-140 | Very superior |
| 110-120 | Superior |
| 90-110 | Normal |
| 80-90 | Dull (rarely feeble-minded) |
| 70-80 | Borderline (sometimes dull, often feeble-minded) |
| Below 70 | Feeble-minded |
| 50-70 | Moron |
| 20 or 25-50 | Imbecile |
| Below 20 or 25 | Idiot |

the IQ," *Psychological Bulletin*, 1940, 37:167-186; K. P. Bradway, "I.Q. Constancy on the Revised Stanford-Binet from the Preschool to the Junior High School Level," *Journal of Genetic Psychology*, 1944, 65:197-217, B. L. Wellman and E. L. Pegram, "Binet I.Q. Changes of Orphanage Preschool Children: A Re-Analysis," *Journal of Genetic Psychology*, 1944, 65:239-263, Skodak and Skeels, "A Follow-up Study of Children in Adoptive Homes," *Journal of Genetic Psychology*, 1945, 66:21-58, B. L. Wellman and B. R. McCandless, "Factors Associated with Binet I.Q. Changes of Preschool Children," *Psychological Monographs*, 1946, 60.1-29, H. E. Garrett, "The Effects of Schooling upon I.Q.," *Psychological Bulletin*, 1946, 43:72-76.

¹⁰¹ H. Woodrow, *Brightness and Dullness in Children* (J. B. Lippincott Company, Philadelphia, 1919), p. 54.

Dr. Terman suggests the following:¹⁰²

| I.Q. | Classification |
|-----------|---|
| Above 140 | "Near" genius or genius |
| 120-140 | Very superior intelligence |
| 110-120 | Superior intelligence |
| 90-110 | Normal or average intelligence |
| 80-90 | Dullness, rarely classified as feeble-mindedness |
| 70-80 | Borderline deficiency, sometimes classifiable as dullness, often as feeble-mindedness |
| Below 70 | Definite feeble-mindedness |

Hollingsworth believes, however, that an individual should have an I.Q. of 180 or above to be classified as a genius.¹⁰³

Other factors, obviously, must be considered in addition to the I.Q. before classifying an individual, and much confusion and criticism in the past have been due to the use of such classifications by "testers" with inadequate training.

HOW ARE I.Q.'s DISTRIBUTED?

People ordinarily think of intelligence as being divided into three groups: the bright, the average, and the feeble-minded. The genius and the idiot seem so remote from each other that they appear to have different kinds of intelligence rather than different degrees of intelligence. It is not surprising that the genius and the idiot should be looked upon as members of different species when one considers the vast differences in their behavior. Take, for example, the boy who was able to read and write at the age of two, mastered algebra and anatomy at seven, spoke four languages at eight years, entered college at 10, and when 11 lectured to a group of Harvard professors on the fourth dimension. Contrast this with the other extreme represented by a child of 10 who expresses himself by means of squeals and grunts, is unable to control bladder or bowels, and can neither feed himself nor walk.

The conception of different kinds of intelligence, however, is contrary to the laws of science. If we were to graph the distribution of either physical or mental traits for the entire population, or for a representative sampling of it, we should find that this graph would conform to a bell-shaped curve commonly referred to in scientific literature as the Gaussian curve or the curve of normal distribution. If

¹⁰² Terman, *The Measurement of Intelligence*, p. 79.

¹⁰³ L. S. Hollingsworth, *op. cit.*, p. 22.

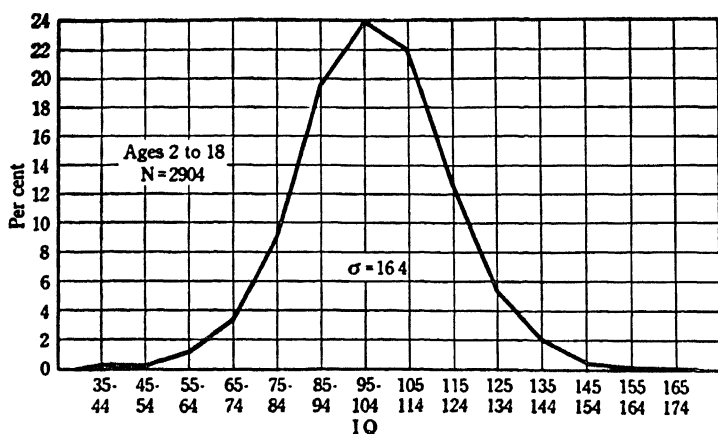


FIG 55 Distribution of I.Q.'s on the Terman-Merrill Revision of the Binet-Simon Scale. (From L. M. Terman and M. A. Merrill, *Measuring Intelligence*, p. 37 By permission of the Houghton Mifflin Company, publishers.)

intelligence is distributed in this manner, half of the group will fall in the middle of the curve and the remaining half will be distributed about equally on either side, showing a progressive decrease in the number of individuals from the middle to the lowest grade of intelligence and also from the middle to the highest grade. There will be then all degrees of brightness and all degrees of dullness, each shading imperceptibly into the other, representing a continuous gradation from the genius to the idiot.

We do find, in fact, that measurable intelligence follows approximately this normal pattern of distribution. This is illustrated in Fig. 55, which shows the distribution of I.Q.'s obtained from the standardization of Forms L and M of the Terman-Merrill Scale. The curve, however, is somewhat more peaked than is the theoretical Gaussian curve.¹⁰⁴

We may conclude, then, by saying that I.Q.'s follow roughly the normal curve of distribution. The genius and the idiot represent the extremes with the majority of individuals clustered around 100 I.Q., which is the center of the curve, and the remainder grouped about equally between the average and the idiot, and the average and the genius.

¹⁰⁴ Terman and Merrill, *op. cit.*, pp. 37-38; McNemar, *The Revision of the Stanford-Binet Scale*, chap. 2; Eli S. Marks, "Sampling in the Revision of the Stanford-Binet Scale," *Psychological Bulletin*, 1947, 44:413-434.

WHAT IS THE VALUE OF INTELLIGENCE TESTS?

The results of intelligence tests may be of great assistance both to parents and to teachers in the guidance of children and youth. As we have seen, little reliance can be placed upon test results secured before the age of two years, but after four years, test ratings are more dependable. In cases in which adoption is considered, especially where little information is available about the child's background, it would be better for prospective foster parents to wait until the child has reached an age where a satisfactory estimate of his abilities can be made. Parents usually are eager to know how well their children are likely to do in school. They should be urged, however, to defer psychological examinations until the end of the preschool period.

Test results on children of preschool age are valuable aids, too, in determining the child's "readiness" for school work. A child who is old enough to enter school and who wants to read may be mentally immature. In such a case his introduction to school work must be postponed and supplemented by a variety of less formal activities until he has developed the capacity to read. This will enable him to meet with success rather than with failure at the outset of his school experience.

Knowing the child's mental capacity should be an asset because it enables adults to take an objective attitude toward what he is able to do. Too often the child of limited ability is expected to accomplish as much as those who are brighter, and this constant unfavorable comparison may lead to serious emotional maladjustment.

The value of tests for school-age children is widely recognized, and results have been used by teachers, administrators, and supervisors in grouping pupils for instruction. An analysis of test results has proved helpful, also, in studying those with special types of disabilities or those who are emotionally maladjusted. In addition, their importance in selecting and providing special programs for mentally atypical children is well known.

Psychological tests are important in the educational and vocational guidance of high school and college students. It should be emphasized, however, that the I.Q. alone has serious limitations for guidance purposes. Other factors, such as special aptitudes, ambitions, work habits, and ability to get along well with others, also are of great importance in both academic and vocational success. The re-

sults of intelligence tests, too, have more negative than positive value for guidance purposes. In other words, we are better able to tell an individual what he should *not* attempt than what he *should* do. Take, for instance, a high school student with an I.Q. of 110 who aspires to become a chemical engineer. He should not be encouraged to pursue this choice, because it has been shown that such a profession requires intelligence of at least 120 I.Q.

It has been estimated that superior mental capacity is necessary for college graduation. Here again, however, personality factors, work habits, and the types of courses chosen may enable a student of average intelligence to graduate.

A major problem in guidance at the present time is that so many high school and college youth of average ability are seeking to enter the higher professional and technical fields and are meeting with failure in the necessary preparatory courses, especially mathematics and science. It seems unwise, also, to encourage all young people indiscriminately to enter college. The real problem is rather to see that those who can profit by college training have an opportunity to secure it regardless of financial or social status. It is evident from A.G.C.T. scores that much good ability is wasted. While most selectees who were college graduates scored in Classes I and II, only about one-quarter of the men in Class I had graduated from college.¹⁰⁵

Although occupations tend to arrange themselves in a sort of intellectual hierarchy,¹⁰⁶ there are interesting exceptions. It was found, for example, on the A.G.C.T. that 9 percent of the boilermakers did as well as the lawyers!¹⁰⁷

Intelligence tests can make their greatest contribution to educational and vocational guidance by bringing about a more realistic understanding of the relationship between an individual's ability and the requirements of various occupations. It is not a question of attempting to associate a specific occupation with a specific I.Q., since a wide range of vocational opportunities is available at the various intellectual levels. Even though this range narrows somewhat for the higher and lower I.Q.'s, the main guidance function of mental tests

¹⁰⁵ Bingham, "Inequalities in Adult Capacity—From Military Data," *Science*, 1946, 104:147-152.

¹⁰⁶ Stewart, *op cit*

¹⁰⁷ Bingham, "Inequalities in Adult Capacity—From Military Data," *Science*, 1946, 104 147-152.

is to indicate the general *type* of occupation which the individual should follow. The final choice of a *specific* vocation will have to be made in the light of a more complete appraisal of all the individual's traits and abilities, and his knowledge of the requirements and duties of that particular job.

SUMMARY

We have defined intelligence as an individual's capacity for adjustment, involving the higher thought processes. Intelligence is regarded as a *quality* of behavior rather than as an entity or a thing in itself. It is really more correct, therefore, to speak of "intelligent behavior" than of "intelligence."

We have seen that intelligence probably is organized as a hierarchy of abilities, more or less closely related. The degree of this relationship is influenced greatly by age and environmental conditions.

We cannot as yet answer satisfactorily the question as to the exact relationship between the nervous system and intelligent behavior. We know, however, that any pronounced disorder in physiological function or any sensory defect will have an adverse effect upon the development and function of the nervous system, and will be reflected in the quality of an individual's behavior.

In studying mental growth during the first two decades we must rely solely upon the results of tests given at successive age levels. These indicate that early mental growth is extremely rapid and variable. The elementary school period is characterized by greater stability, which may be due largely to the development of a general intellectual factor. Intellectual growth begins to slow down in early adolescence and seems to have reached its peak by about the twentieth year. The fluctuations occurring at this period may result in some measure from environmental stimulation and specialization of interests.

Both heredity and environment are necessary to the development and function of intelligence. Present evidence seems to give somewhat greater weight to heredity than to environment, but we are not justified in assigning definite percentage values to represent the relative contribution of these two influences to the intelligence of *all* individuals.

There appear to be no major sex differences in intelligence, although certain test items favor one sex more than the other.

Little relationship has been found between health and intelligence, but serious physical defects may affect intellectual development. Children who mature early usually show a spurt in mental growth, while those who mature late are slower in their rate of mental development.

Temporary emotional and personality disturbances do not seem to have much effect upon mental test scores, and underlying growth factors probably are more important.

There is a positive relationship between measurable intelligence and socioeconomic status as judged by certain rating scales. The latter, however, do not take into consideration the *subtle* home influences. We must be careful, also, not to assume a causal relationship between intelligence and socioeconomic conditions. However, differences in motivation, varying methods of test presentation, and differences in cultural standards may affect intelligence test scores markedly.

Practical intelligence testing began with Binet's work in Paris in 1904, and Dr. Henry H. Goddard is responsible for bringing Binet's scale to America. The Stanford Revision of the Binet Scale (1916) has been the most extensively used individual intelligence test in this country. It is being replaced by the Terman-Merrill revision published in 1937. Other individual scales have been developed for preschool children and adults.

The testing of Army recruits during the First World War gave a great impetus to group tests, and these are now widely used where economy of time is essential. The A.G.C.T. developed during the Second World War now is available for civilian use.

Performance tests have been devised to meet situations wherein an individual may be penalized by the so-called verbal tests. They generally include three types: geometrical forms, picture puzzles, and mazes.

Some of the items used to gauge intelligence are: analogies, opposites, comprehension questions, vocabulary, similarities and differences, completion, absurdities, deferred memories, memories for meaningful material, and mechanical or rote memories.

The I.Q. is a predictive measure and tells what can be expected mentally of an individual in the future. This predictability, naturally, depends upon its constancy. From the available evidence, we may conclude that the I.Q. is roughly constant, depending somewhat

upon age, background, degree of brightness, and emotional stability. I.Q.'s are interpreted according to some definite classification. Their distribution in the general population conforms roughly to the normal curve with the majority of cases occurring around the middle.

Intelligence tests may be used advantageously with children of preschool age to indicate their readiness for school work, with older children for purposes of instruction and classification; and in the adjustment of individual problems. The results of intelligence tests, also, may be of great assistance in the educational and vocational guidance of high school and college students.

Learning probably is more closely related to intelligence than is any other aspect of behavior, consequently, we shall devote the next chapter to a consideration of how we learn.

SUGGESTED ACTIVITIES

1. Ask your instructor to give your class a group intelligence test. (a) Choose a committee to tabulate the items most frequently missed by men students and by women. (b) Discuss the way in which your scores are interpreted, i.e., as I.Q.'s, percentiles, or standard scores, and what these mean.
2. If you know of any identical twins, report to the class about their similarities and differences in intellectual attainment
3. Read one of the following references on the Dionne quintuplets, and discuss their intelligence.

H. H. Newman, *Multiple Human Births*, Doubleday and Company, New York, 1940, chap. 9.

W. E. Blatz and D. A. Millichamp, "The Mental Growth of the Dionne Quintuplets," in the *Collected Studies on the Dionne Quintuplets*, University of Toronto Press, Toronto, Ontario, Canada, 1937, No. 2.

Blatz, *The Five Sisters*, William Morrow and Company, Inc., New York, 1938.

4. Examine one of the following scales for measuring socioeconomic status, and, if possible, have a friend fill out one so that you can rate it.
Minnesota Home Status Index by A. M. Leahy, University of Minnesota Press, Minneapolis.
Sims Score Card for Socio-Economic Status by V. M. Sims, Public School Publishing Company, Bloomington, Illinois.
5. Ask your instructor to show you the materials for the Terman-Merrill Scale, the Wechsler-Bellevue Scale, preschool tests, and some of the performance tests mentioned in this chapter. If possible, observe the

administration of some of these tests and discuss your observations in class.

6. Secure permission to interview a school principal or guidance officer to ascertain what use is made of intelligence tests, and report your findings to the class.
7. Report to the class, withholding names, any instance of which you may know in which an individual's vocational ambitions are not warranted by his mental ability.
8. What would you advise in the following case?

A high school boy with an I.Q. of 95 wishes to become a lawyer. He is very likable, is a good public speaker, and is a hard worker. His father is a successful grocer and can finance his son's way through law school.

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CHAPTER 8

HOW WE LEARN

WHAT IS LEARNING?

The term "learning" may mean quite different things to different people. When teachers say that some classes learn more than others, they usually mean that the "better learners" show more ability to improve their solutions of everyday school problems than do the "poorer learners." They probably make fewer errors, they finish their work faster or with less energy, or their achievement shows all these qualities. Fathers and mothers may think of their children's learning not only in terms of school marks but also as the improvement of attitudes, the mastery of social skills, like table manners, and the performance of household chores. To the child of school age learning may mean either the opportunity to participate in interesting activities and experiences or a necessary routine which must be endured. Outside school the child commonly thinks of learning as the acquisition of play techniques and other skills which are valued by child society. Again, the college student may think of learning as the accumulation of grades, honor points, and credit hours. He may regard it, too, as a means of acquiring specific knowledge and skill which can be used in some definite vocation. Or it may be thought of as the broadening of experience and the development of one's resources for better living. Extracurricular activities, such as athletics and social events, also figure prominently in the student's notion of learning.

These illustrations of different ideas of learning might be multiplied indefinitely. They all point, however, to the concept of learning as the continuous change or modification of behavior brought

about by physical or mental activity or both. This constant modification of behavior is necessary to enable the individual to adjust to changing life situations

Although this general definition may seem relatively simple, the actual learning process is very complex. The degree of complexity may vary, also, with the age of the learner, the situation in which the learning takes place, and the nature of the task to be mastered. Thus, the acquisition of a motor skill, like skating or typing, accentuates a different phase of learning from that involved in a solution of an abstract problem in mathematics, or the formation of an attitude toward some social or political issue. Nevertheless, these seemingly different activities are merely different aspects of the same basic process of learning.

Before proceeding further with a detailed consideration of learning, we shall attempt to clarify the nature of the relationship existing between learning and maturation, and learning and intelligence. It is difficult to draw a sharp distinction between learning and maturation.¹ In fact, it has been suggested that they may be but two phases of the same process. Ordinarily, the term "maturation" refers to the *early* growth of the nervous system which makes possible the development of certain types of behavior relatively independent of environmental influences.² The term "learning," on the contrary, is customarily used to describe *acquired* habits, skills, and knowledges resulting primarily from environmental conditions. For instance, as we have seen in the discussion of motor development, the *ability* to walk is not a learned response, but results from the gradual maturing of neuromuscular patterns which become perfected through practice. The most advantageous time to introduce school activities, like reading and arithmetic, also depends more upon maturational processes than upon actual chronological age. As we shall see in Chapter 13 many six-year-old children are not ready to read when they enter school, because their nervous systems are not sufficiently mature. It has been found, also, that most fourth-grade children are too immature to master long division, and the trend in the modern school is to defer it until the fifth grade.

¹ M. B. McGraw, *Growth: A Study of Johnny and Jimmy* (Appleton-Century-Crofts, Inc., New York, 1935), pp. 8, 117, 311.

² A. Gesell, "Maturation and Infant Behavior Patterns," *Psychological Review*, 1929, 36:307-319.

The relationship between learning and intelligence, also, has been a source of much controversy and confusion. In the preceding chapter we suggested that intelligence is our appraisal of the individual's *capacity* to make adjustments to varying life situations. On the other hand, as we have just pointed out, learning represents the *use* of this capacity in adjusting to life situations by the acquisition and perfection of new skills and experiences. Presumably, intelligence depends upon basic neural structures which are determined largely by heredity, and therefore cannot be altered greatly by environmental factors. Within these general biological limits, however, certain modifications *can* be effected through environmental conditions, and these modifications constitute learning.

Some writers insist that intelligence and learning are independent of each other and function as separate processes.³ It is claimed, also, that *intelligence* tests really are measures of *learning*. To some extent this latter point of view is justified, because, as we have explained already, the only method we have of estimating an individual's capacity is to ascertain the use which he has made or can make of it. In general, however, the consensus of opinion seems to be that intelligence represents the fundamental ability or abilities which make learning possible, and therefore, that there is a very close relationship between them.

HOW ARE PERCEPTION AND THINKING RELATED TO LEARNING?

In our description of the neonate in Chapter 3 we saw that his sensory equipment is sufficiently well developed at birth to insure survival. The newborn baby, however, is unable to attach meaning to the various sensory stimuli which he receives from the world around him. Although he can "see" in the sense of receiving visual impressions, they have little or no meaning for him. When he is able to select certain impressions from one or more sensory avenues and to interpret them as meaningful experiences, then we can say that perception has begun.

It will be recalled that a very simple form of learning, known as conditioning, has been obtained in neonates. It may be possible even

³ H. Woodrow, "The Ability to Learn," *Psychological Review*, 1946, 53.147-158; D. Simrall, "Intelligence and the Ability to Learn," *Journal of Psychology*, 1947, 23.27-43.

before birth, although this has not yet been established definitely. As was pointed out, however, this type of learning is purely mechanical and is governed by the spinal cord and lower brain centers. Such conditioned learning has been demonstrated in babies under two weeks of age, although it tended to fade out rapidly. Later experiments⁴ have shown that it was impossible to establish a simple form of conditioning before the age of 54 days and normally not until 65 days. Obviously, the scope of this simple mechanical conditioning is very limited, and not much progress is made in *real* learning until the child develops sufficient perceptual ability to give meaning to his experiences.

Numerous illustrations of perceptual development are found in practically every chapter of this book. For the sake of clarity, however, a few of these will be cited here from the field of motor development, language, and social growth. The ability to single out particular elements from a total situation and to give them meaning develops slowly, as is illustrated by the growth of manipulation. The child's eyes are uncoordinated at birth and are incapable of focusing upon objects before the end of the second month. When this point is reached, visual perception has begun; it is even more apparent by the end of another month, when he can follow a moving object with his eyes. At about three or four months of age, also, he places his hands on the bottle or breast when being fed, and around five months he will pat it while he sucks.

As we have said, the appearance of *real* language is dependent upon the development of perception, because the child then recognizes the meaningful relationship between sounds and objects, persons, and situations.

Smiling is a good example of the role of perception in social development. At first it may result from internal stimulation or from a light touch upon the cheek. The first *social* smile, however, does not occur until around two months of age. At this time an infant will smile at an adult and will express his pleasure in the company of children and grownups by kicking, cooing, and laughing aloud.

With the progressive development of perceptual and motor behavior and the continuous growth of language, there is a steady expansion and enrichment of the child's experience during the pre-

⁴ J. J. B. Morgan and S. S. Morgan, "Infant Learning as a Developmental Index," *Journal of Genetic Psychology*, 1944, 65:281-289.

school years. Self-centeredness, which is so prominent in his early growth, gradually decreases with the widening of his social contacts. Conditioning still is a dominant factor in the child's learning, but it is on a higher level than the simple mechanical process which characterizes infant development. It continues to play an important role until the sixth or seventh year, when it is supplemented and complicated by other phases of the learning process. Nevertheless, as we shall see, conditioning may be present in the learning both of older children and of adults.

Most of the elementary school child's percepts are concrete, that is, they must be related closely to his actual experiences. Eventually, with greater maturity and adequate guidance, he is able to make abstract generalizations from these concrete experiences and can apply such generalizations to other specific situations. This really marks the beginning of concept formation, and does not take place ordinarily prior to the beginning of the junior high school years. Although this is probably the most important and characteristically human phase of learning, it is often the most neglected, especially among high school and college students. Too often they are satisfied merely to memorize textbook and lecture material and "hand it back," instead of attempting to formulate their own ideas on the basis of extensive reading and thinking.

Orientation is a basic factor in perceptual learning, and this ability to locate events properly in time and space develops gradually. The preschool child is not very well oriented in time, but there are great individual differences in this regard. He cannot differentiate morning from afternoon until the age of four years or later, and has very vague ideas about the *days of the week*. In an investigation on preschool children of high average to very superior intelligence,⁵ it was found that about half of them could name the *days of the week* correctly as early as five years. The days at the beginning or end of the week were the easiest to name, while those in the middle were the most difficult. Between 18 and 30 months the child is concerned with the present. After this, ideas of the future and then of the past develop. This preoccupation with the present makes it difficult for the small child to comprehend the passage of time. For example, a

⁵ L. B. Ames, "The Development of the Sense of Time in the Young Child," *Journal of Genetic Psychology*, 1946, 68.97-125.

three-year-old who was given a cookie in midmorning with the promise of another that afternoon was back within 15 minutes asking if it was now afternoon, so that he could get his cookie.

Even when the child goes to school he may still have trouble in remembering the *days of the week*, and especially their correct sequence. He will be seven before he knows what month it is, and eight before he can name the months in their correct order and can tell the *day of the month*.⁶ For these reasons, the old routine procedure of having first-grade children mark the *days of the week* or *month* on a calendar probably has little meaning for them. These time concepts develop gradually through maturation, and attempts to teach them before the child is ready are futile.

The very bright preschool child, however, usually is advanced in time concepts. He may understand the idea of a year, e.g., 1950, which the average child does not grasp until about the age of eight or nine. A gifted boy with an I.Q. of 146, not yet six years of age, made a perpetual calendar, and took great delight in telling others on what day of the week certain future events, such as holidays, would occur.

Telling time mystifies the average beginning school child, and it does not become a meaningful experience for him until he can associate his activities with the clock. Primary teachers, therefore, devote much effort to showing what the hands of the clock look like at the hour, half-hour, and quarter-hours, and to associating activities with these various positions.

In general, the average child is not well oriented as to time before he is 9 or 10 years of age. This fact is important in relation to problems of dawdling, and of playing on the street when sent on errands.

Comprehending the meaning of centuries and their sequence, which is necessary for the understanding of history, requires considerable maturity. This ability probably becomes apparent first around 12 years of age, and usually improves as the individual grows older. Even in high school and college, however, students often have difficulty in grasping the meaning of time sequences sufficiently to make history meaningful.

From the standpoint of orientation, also, it is necessary for the child to gain an understanding of space relationships. Such concepts

⁶ *Ibid.*, p. 105.

as "up and down," "above and below," "before and behind," and "right and left" are somewhat confusing to the preschool child.⁷ As in the case of time concepts, however, small children show wide differences in the ability to use words denoting space.

Approximately the same group of children who participated in the experiment on ideas of time mentioned above took part, also, in an investigation of verbalized space concepts.⁸ Before the age of two years, questioning the child about space was futile, and most of the data for that period had to be obtained from the observation of spontaneous or directed play. The earliest space words are one-dimensional, as "up," "down," "on," "off," and occur between 18 and 21 months. It is interesting to note, also, that the idea of "up or above-ness" develops before the concept of "down or belowness." In replying to questions about space the two-year-old gives very general answers. These become quite specific at two and a half and then more general again at three years. Thus, when asked, "Where do you sleep?" the two-year-old may say, "Home" or "At home." At two and a half years his answer may be: "In my crib" or "In my bed," whereas at three years he may respond, "In my room." The greatest number of new space words is added to the child's vocabulary between two and two and a half years. With increasing age, space words become more exact from the standpoint of location, and by the age of four they include the neighborhood and community. The investigator concludes that despite individual differences there is a definite sequence in the development of verbalized space concepts among preschool children.

Although his home as a definite place becomes increasingly meaningful to the preschool child, he may get lost if only a short distance away. By the time he is six years old, his orientation generally has improved to the point where he may be able to go to and from school by himself.

Since home is the place the child understands best, it is the center around which the school develops its social studies program. As the child's horizon expands, and he becomes more familiar with his

⁷ Bobertag, as quoted by L. Terman in *The Measurement of Intelligence* (Houghton Mifflin Company, Boston, 1916), p. 176

⁸ L. B. Ames and J. Learned, "The Development of Verbalized Space in the Young Child," *Journal of Genetic Psychology*, 1948, 72:63-84.

neighborhood and community,⁹ the school capitalizes upon these broadened experiences. As he nears his ninth birthday, the child is able to extend his thinking to more distant places, such as his state and county. Spatially, other lands do not mean much to him, however, until he is about the age of 12. Obviously, therefore, any map work involving foreign countries will not be very real to him before this time. In fact, a clear understanding of space relationships involving the entire world is not gained until the high school and college levels.

The child with a high I.Q. and a vivid imagination may have meaningful space concepts before these are developed by the average individual. This is illustrated by a five-year-old boy with an I.Q. of 184 who created an imaginary land which he called "Borningtown." Until he was 10 years old he spent many hours peopling the land, drawing maps of it, composing its language, and writing its history.¹⁰

The extent to which the average mature individual really understands astronomical space relationships is not definitely known. It seems probable, however, that only a few superior individuals, whose interests lie definitely in this field, are able to understand their meaning fully.

Attention is another important aspect of perceptual learning. It is the process whereby the individual selects a certain stimulus or group of stimuli from the vast number which surround him, and concentrates upon them to the exclusion of others. The length of time one can focus uninterruptedly upon a particular object or situation is called the duration of attention, while the number of things which can be taken in at once is known as attention span.

It will be recalled from Chapter 5 that prior to the second month the baby exhibits nothing which can properly be called attention. At 16 weeks, however, he will stare for 4.75 seconds at a cube placed before him. This increases to 18 seconds at 28 weeks, but by the end of the first year it decreases to 10.75 seconds.

As the child grows older there is a general lengthening in the amount of time he can focus his attention upon any particular thing.

⁹ A. Gesell and F. L. Ilg, *The Child from Five to Ten* (Harper & Brothers, New York, 1946), pp. 441-443.

¹⁰ L. S. Hollingworth, *Public Addresses* (The Science Press Printing Company, Lancaster, Penna., 1940), pp. 25-26.

There are great fluctuations, however, depending not only upon the child himself but upon the nature of the material and the situation as well. Furthermore, the same child may show wide differences in attention at different times. Despite these variations, there is a steady average increase in the duration of attention throughout the preschool years. This is shown in a typical study of spontaneous play activities of preschool children using 12 different play materials.¹¹ The mean duration for each year was as follows:

| Age | Mean Duration in Seconds |
|-----|--------------------------|
| 2 | 6.9 |
| 3 | 8.9 |
| 4 | 11.4 |
| 5 | 12.6 |

In general, the span of attention also increases with age. Whereas the infant can concentrate only upon a single object, the older child can attend to much more complex situations. The degree of this complexity is affected greatly by the nature of the activity involved and the strength of his motivation.

After the child enters school the duration and span of his attention are influenced so greatly by motivation, work habits, teacher's personality and methods, etc., that it is practically impossible to evaluate attention as a separate process.¹² The fleeting interests and mind wandering of elementary and high school pupils often are the source of much friction between them and their teachers and parents. Many adults seem to believe that attention is some mysterious power which can be exerted at will. Consequently, they often command children to "pay attention" without realizing that they usually are attending, but not to the matters which the parent or teacher considers important. To secure the fullest measure of attention of which the individual is capable, the task must be one within his level of maturity and primarily of his own choosing. He must be challenged by the situation¹³ and must be sustained by the cooperation and guidance of others who are interested in what he is doing.

It is clear that the various phases of perceptual development which

¹¹ D. Van Alstyne, *Play Behavior and Choice of Play Materials of Preschool Children* (University of Chicago Press, Chicago, 1932)

¹² A. I. Gates, A. T. Jersild, T. R. McConnell, and R. C. Challman, *Educational Psychology* (The Macmillan Company, New York, 1942), pp. 184-185.

¹³ H. L. Kingsley, *The Nature and Conditions of Learning*, p. 288.

we have been considering form part of the necessary background of thinking. Although thinking is a highly complicated process, it involves principally the drawing of conclusions or inferences from our ideas and experiences.

John Dewey, the well-known American philosopher, insists that *real* thinking occurs only when the individual attempts to solve a specific problem.¹⁴ Such problem solving follows in general certain definite steps. Beginning with the awareness, definition, and delimitation of the problem, the individual next proceeds with a search for possible solutions. He evaluates these in the light of his experience and discards suggested solutions which are not pertinent to the problem. Finally, he forms an hypothesis, the soundness of which is tested by subsequent experience. If it proves satisfactory, he draws generalizations from it which will serve in the solution of future problems. Although other philosophers have criticized Dewey's interpretation of thinking for being too narrow, it has, nevertheless, contributed much to a clearer understanding of the thinking process as it occurs in everyday life. The school, particularly, has benefited by the application of Dewey's "steps" to the solving of problems in arithmetic. Modifications of these stages have been made, and it has been suggested, also, that a distinction should be drawn between the *methods* and *materials* of thought.¹⁵

The ability to grasp cause-and-effect relationships is a necessary element in the thinking process. When we discussed language development in Chapter 6, we saw that small children are able to comprehend simple causal sequences before they can express them adequately. The development of ideas of causality has been the subject of considerable research and discussion.¹⁶ Piaget, a Swiss psychologist, believes that this ability progresses through three main periods, comprising 17 distinct stages, between the ages of 3 and 11. He refers to the first two periods of causal development as "pre-causality," and to the third period, which begins around the age of seven or eight, as "true" causality. In the early stages, the child fails to differentiate between inner and outer experience, and explains

¹⁴ J. Dewey, *How We Think*

¹⁵ D. M. Johnson, "A Modern Account of Problem Solving," *Psychological Bulletin*, 1944, 41:201-229.

¹⁶ J. Piaget, *The Child's Conception of Causality*, also I. Huang, "Children's Conception of Physical Causality: A Critical Summary," *Journal of Genetic Psychology*, 1943, 63:71-121.

the world in terms of the self *True* causality, however, appears when the child can separate subjective from objective experiences and can explain happenings as being caused by mechanical forces outside himself.¹⁷

From his studies of children, Piaget is convinced that the understanding of causality evolves steadily from stage to stage, primarily as the result of maturation. This is not confirmed, however, by an American investigator¹⁸ who studied over a thousand children of slightly more than average intelligence between the ages of 8 and 16 years. Following Piaget's methods, she asked some children questions requiring causal explanations. Others were asked to give such explanations after witnessing the demonstration of simple experiments. She failed to find any evidence for classifying the development of causal thinking into definite stages. Although there was a general increase with age from primitive to more mechanistic and logical explanations, much overlapping existed between the different age levels. In no age group could the answers be classified into a single type. Many older children gave primitive explanations, whereas some of the younger ones offered very mature answers. However, the kind of question asked was of greater significance than age in determining the answer given. Boys were superior to girls in causal thinking, giving a higher proportion of mechanical and logical explanations. Girls gave more phenomenistic interpretations, that is, they assumed that when two things occurred together, one *caused* the other.

According to this study,¹⁹ socioeconomic status and intelligence have little relationship to causal thinking. It appears, also, that this ability, although influenced by age, is not so much the product of maturation as it is of school training. In other words, although we must think in order to learn, we also must learn to think. Obviously, the educational background of an individual affects profoundly his ability to interpret causal relationships correctly.

Although some adults question the thinking ability of small children, many of their "bright" sayings illustrate that they *can* and *do* reason within their range of experience. From the grownups' stand-

¹⁷ Piaget, *op. cit.*, pp. 267-268.

¹⁸ J. M. Deutsche, "The Development of Children's Concepts of Causal Relations," in Barker, Kounin, and Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 8.

¹⁹ *Ibid.*, pp. 143-144.

point, children may not always arrive at correct conclusions, and they usually are quite uninhibited by accepted social standards. This is shown in the following illustrations:

A girl who had been punished for sucking her thumb cried and cried. Finally, her small brother said, "Dumbie, suck the other thumb."²⁰

Another little girl before her fourth birthday had been told that God was inside her. One day she refused to eat or to drink her milk, and upon being asked why, replied: "It will get all over God."

A little boy watched his baby sister being fed first from one breast and then from the other. This was followed by orange juice given laboriously from a teaspoon. At last he remarked to his mother: "God was very clever to put milk there, Mummy, but I think he would have been much more clever if he had put orange juice in one."²¹

Children are known to arrive at judgments and generalizations as early as 2 to 4 years, but there is considerable improvement from 6 to 12 years and beyond. Bright children are able to do this at a very early age, whereas one of the greatest difficulties confronting the subnormal child is his inability to generalize. The following incident may serve to illustrate this point. In a certain institution for the feeble-minded a subnormal child stole a handkerchief from the matron. The child was told that this was wrong, but the next day she stole a handkerchief from someone else. The fact that she had done wrong was again impressed upon her, but the incident was repeated many times with different individuals. The fundamental difficulty was that the child was unable to see the generalization that stealing *anyone's* handkerchief was wrong.

As noted already, the thinking of older individuals sometimes is on a rather immature level.²² This is evidenced to some extent by their gullibility and belief in superstition.²³ Even college students hold superstitious beliefs, although they can be reduced materially by

²⁰ R. W. Washburn, *Children Have Their Reasons* (Appleton-Century-Crofts, Inc., New York, 1942), p. 114.

²¹ G. M. Goldsworthy, "Nursery Schools," *Journal of the Royal Society of Arts* (London, England), 1944, 92:66-75, especially p. 70.

²² S. H. Britt, *Social Psychology of Modern Life* (Rinehart and Company, Inc., New York, rev. ed., 1949), chap. 9.

²³ E. E. Emme, "Modification and Origin of Certain Beliefs in Superstition Among 96 College Students," *Journal of Psychology*, 1940, 10:279-291.

specific instruction, as is shown by Emme's experiments. It is interesting to note that parents have the greatest effect in determining belief or disbelief in superstition. Chums, courses, and reading also may be influential. It is said that approximately 125 million dollars is spent annually on fortunetellers in the United States alone.²⁴ Evidently, we need not only wider experience but also more effective training and guidance in the thinking process.

SOME THEORIES OF LEARNING

Having considered briefly the relationship between human learning and perception and thinking, we shall now turn our attention to some of the theories which have been advanced to explain how learning takes place. In the past, psychologists have sought to understand the nature of learning by experimenting upon animals. Much valuable information was gathered in this way, and it is still regarded as a productive field of research. There are many dangers, however, in assuming that what is characteristic of animal learning is true also of human beings. Particular emphasis has been laid upon this fact during recent years, with the increasing recognition of the role played by complex personality and cultural factors in human learning.

In the three representative theories of learning which we shall discuss—(1) connectionism, (2) conditioning, and (3) field theory—we shall see that the first two depend to a great extent upon data from animal learning. The third, although influenced by research on animals, deals more specifically with the learning of human beings.

WHAT IS CONNECTIONISM?

One of the most widely accepted and influential theories of learning has been that of connectionism, or the establishment of neural bonds between stimulus and response. This theory was promulgated by Professor E. L. Thorndike of Columbia University and his followers, and probably has had a greater effect upon school procedure than has any other theory. According to this point of view²⁵ every

²⁴ J. R. Saunders, "Superstition Is a Big Business," *Science Digest*, March, 1946, p. 69.

²⁵ E. L. Thorndike, *Educational Psychology*, Briefer Course (Teachers College, Columbia University, New York, 1917), Part II; N. B. Henry (ed.), *The Psychology of Learning. The Forty-First Yearbook of the National Society for the Study of Education*, chap. 3 by P. Sandiford and chap. 4 by Arthur I. Gates.

act, physical or mental, involves the setting up of specific pathways in the nervous system. To learn a new act, the required pathways between stimuli and responses must be established first. Through repetition, the resistance offered to the passage of nervous energy along the pathways becomes less and less, and, consequently, the performance of the act becomes progressively easier.

This neural bond theory led to the formulation of certain specific laws and their corollaries,²⁶ which were supposed to govern the learning process. The better-known ones are as follows: (a) the Law of Use or Exercise, (b) the Law of Effect, and (c) the Law of Readiness. The first law assumes that if an individual is expected to learn, he must have an opportunity to repeat the act correctly and frequently, and if it is to become permanent, no exception should be permitted. In other words, "correct practice makes perfect." It is recognized, however, that the human learner is not just a robot. He has attitudes and feelings toward what he is doing, and the mere mechanical repetition of an act is not sufficient to produce effective learning. This is illustrated by the classic story of the boy who insisted upon saying "I done" and "I have went." His exasperated teacher finally made him stay after school and ordered him to write out the correct forms, "I did" and "I went," each one hundred times. While he was working at this task the teacher was called out of the room and upon her return found the exercises neatly done lying on her desk with a note reading.

"I *done* the work and *have went*."

John"

As Professor Kilpatrick²⁷ has said, it is "practice with satisfaction" which brings results. If learning is satisfying there will be a tendency for the performance to be repeated, but, if annoying, the learning will be inhibited or eliminated.

This satisfaction or dissatisfaction which accompanies practice has been incorporated into a second law of learning, the Law of Effect. This means simply that, if the effects produced by attempts to learn are unpleasant, efforts will cease, and presumably no learning will take place. On the other hand, if learning is accompanied by pleasantness, the learner's efforts will be reinforced, and he will be stim-

²⁶ Thorndike, *op cit*.

²⁷ W. H. Kilpatrick, *Foundations of Method. Informal Talks on Teaching* (The Macmillan Company, New York, 1925).

ulated to greater accomplishment. An illustration of this law is seen in the case of the individual who is beginning piano lessons. At first his task may seem difficult because he lacks the necessary fundamental skills and thus gains little satisfaction from his initial efforts. As soon as he is able to play some simple melodies from which he derives pleasure, however, his progress usually will be much more rapid. The piano lessons given over the radio are an example of this. The first attempt is to teach the individual to play some familiar tune, and thus spur him to further effort by giving him the satisfaction of immediate achievement.

The third law of learning, the Law of Readiness, may be illustrated by the old adage: "You can lead a horse to water, but you can't make him drink." The first two laws are ineffective unless the individual has the initial *desire* to learn or is "sold" on the idea. If a task is forced upon him the performance of it will be distasteful, and the negative aspect of the Law of Effect will operate to prevent efficient learning.

The advocates of connectionism would insist that the successful teacher should spend much time and thought in developing methods of approach which will arouse the interest of her pupils and make them want to learn. They would say, too, that many misunderstandings between parents and children arise because adults fail to recognize the Law of Readiness. Such parents often summon children from an engrossing occupation to do a trifling errand or to perform a small service, and may punish them because they respond unwillingly.

Connectionism, generally, has stressed the trial-and-error nature of learning in an unfamiliar situation. In this form of learning the behavior of the animal or the individual is very random at first but becomes patterned through chance. This is well illustrated by a famous experiment of a hungry cat placed in a puzzle box. A bit of fish outside the box served as a goal. At first the cat made a number of random movements, trying to squeeze through, bite, or claw the bars. Finally, by chance, it hit against a wooden button which released a door, and the cat was free to get the food. Numerous repetitions of this experiment resulted in fewer errors, less expenditure of energy, and greater speed in releasing the door. At last the cat turned the button around without delay whenever put in the box.²⁸

Similarly, when placed in a maze a cat will go into many blind

²⁸ Thorndike, *op cit.*, p 129.

alleys or cul-de-sacs before it finally gets out. With practice, it learns where the blind alleys are, and as errors are eliminated its performance loses its random character, and definite patterning results.

In this type of learning the goal and the drive are important factors. If the cat described in the preceding experiments had not been hungry, it probably would have gone to sleep; but its hunger and the fish were the motivating forces to solving the puzzle or maze. Other drives, such as thirst, sex, pain, and punishment, also, have proved effective in animal experiments. In trial-and-error learning there is a noticeable restlessness or tension exhibited by the animal or human subject until the situation is mastered. It will be noted, also, that the Laws of Exercise and Effect operate together throughout the trial-and-error process.

Man experiences trial-and-error learning not only with objects but with ideas as well. Although this is commonly referred to as "problem solving," it is not basically different from the simple trial-and-error learning of animals described above. It is much more efficient, however, because it enables the individual to substitute ideas for overt behavior and thus attain his goal with greater rapidity and accuracy. An illustration of problem solving is found in a simple experiment which the authors²⁹ made on the maze-learning ability of blind children between the ages of 8 and 16 years. It was found that those who made use of verbal cues, like attaching numbers to the cul-de-sacs, were more successful than those who depended solely upon trial and error without ideas. In problem solving, too, the learner must be aware of a *goal* to be reached, and must have a sufficiently strong drive or motive to sustain his activity until this goal is attained.

When one considers the theory of connectionism, it seems at first to account satisfactorily for most kinds of learning. On closer examination, however, it proves to be an oversimplification of the highly complex learning process. We do not learn by exercising particular stimulus-response (S-R) bonds without affecting the rest of the organism. Instead, learning is a widespread modification which involves the *entire* individual. This is shown by the fact that al-

²⁹ R. V. Merry and F. K. Merry, "The Finger Maze as a Supplementary Test of Intelligence for Blind Children," *Journal of Genetic Psychology*, 1934, 44:227-230.

though we learn to write ordinarily with the forearm, wrist, and hand, we can, nevertheless, trace legible letters in sand or dust with our toes, or can even make them with a pencil or pointer attached to our elbow³⁰

It is claimed, too, that connectionism overlooks the fact that too much repetition, even of a satisfying activity, may lead to boredom and disuse.³¹ The Law of Effect has been criticized because it assumes that the same pleasant experience is repeated over and over in circular fashion. Actually, as one writer says, this is true only of infants, imbeciles, or pathological cases.³² What really seems to happen is that one satisfying activity leads on to another, which may be similar but is not identical. For instance, a college student who makes an "A" in a course does not repeat it because of his satisfaction with his success. Rather, he goes on to some new course where new satisfactions may be gained.

There is little agreement at present as to the status of the Law of Effect in relation to learning theory. While some claim that it is an important law, others maintain that it is only a condition of minor significance in the learning process. There is no unanimity either about the fundamental nature of pleasantness and unpleasantness as they operate in learning.³³

The idea of learning as trial and error also is an oversimplification. It has been shown, for example, that an individual's reactions in a problem situation never are entirely random. Such a situation has some meaning for him even though it may be limited at first. His initial attempts to solve the problem, therefore, are governed by this meaning, even though they may appear as random to the observer.³⁴ As meaning increases, the learning takes on a more patterned and purposeful form. Despite its limitations, connectionism has contributed much toward a better understanding of learning, especially with regard to the effective use of rewards and punishments. It still

³⁰ Henry (ed.), *op. cit.*, chap. 5 by G. W. Hartmann, especially p. 184.

³¹ *Ibid.*, chap. 6 by K. Lewin, especially p. 234

³² G. W. Allport, "Effect. A Secondary Principle of Learning," *Psychological Review*, 1946, 53:335-347.

³³ L. Postman, "The History and Present Status of the Law of Effect," *Psychological Bulletin*, 1947, 44:489-563; read also "A Note on Postman's Review of the Literature on the Law of Effect," by G. R. Stone, *Psychological Bulletin*, 1948, 45:151-160.

³⁴ Henry (ed.), *op. cit.*, p. 193.

has many advocates and often appears as the basic point of view in a systematic presentation of educational psychology.

WHAT IS CONDITIONING?

Like connectionism, conditioning is fundamentally an associative theory of learning. As we noted in Chapter 3, the term "conditioning" refers to a change in behavior wherein "a response ordinarily connected with one situation becomes associatively attached to or conditioned to a wholly different situation."³⁵ We saw that this simple form of learning is possible in newborn babies. For example, in one experiment seven out of eight neonates made feeding reactions to the sound of a buzzer instead of to the original bottle stimulus.

Many of the early conditioning experiments were performed on animals, although some were carried out on infants and children. Even today, laboratory research on conditioning makes much more use of animal than of human subjects.

The Russian physiologist, Pavlov, and his students generally are considered to be pioneers in work on the conditioned reflex. Their investigations aroused interest in America during the early years of the twentieth century. It remained for J. B. Watson, however, to promote the idea of the conditioned response as a theory of behavior.³⁶ This theory reached the height of its popularity during the 1920's but declined considerably thereafter, because many aspects of it were not substantiated by experimental evidence.

Although conditioning as a theory of learning has many limitations, it does seem to account for much of the simple learning which goes on in everyday life. This is particularly true in situations which are accidental or incidental, and where the individual concerned makes no conscious effort to control the conditions.

The well-known example of the child and the hot stove illustrates conditioned learning. The first time a child sees a heated stove he may touch it and burn his finger. Thereafter, the mere sight of a stove may cause him to substitute crying or a withdrawal response, or both, for the reaching reaction. Again, if, as a baby reaches out his hand for a cookie, the lid of the cookie jar clinks, eventually the mere

³⁵ L. A. Averill and F. C. Kempf, *Psychology Applied to Nursing* (W. B. Saunders Company, Philadelphia, 1938), p. 227

³⁶ E. R. Hilgard and D. G. Marquis, *Conditioning and Learning*, pp 7-16.

clink of the lid, without the proffered sweet, will cause the child to stretch out his hand. In the next chapter we shall see, also, how conditioning operates to produce emotional responses, such as fears.

Illustrations of conditioning abound likewise in animal behavior. Dogs and cats come to respond to their names, as well as to people and objects, through conditioning, and it is in this way that they are taught to perform tricks. Professor Kellogg³⁷ tells how Gua, an ape reared with his son, was conditioned to certain clothes worn by him and by his wife. If they donned unfamiliar ones, the ape barked at and shunned them.

Since conditioning is largely governed by chance, it must be emphasized that this type of learning may fade out in time, unless the initial experience is very vivid or the original stimulus is reassociated occasionally with the substitute response in a process known as reinforcement. Pleasantness or unpleasantness, also, may affect the permanence of conditioned responses. In general, if the outcome of the conditioned behavior is satisfying, it is more likely to be lasting, whereas, if the results are annoying, the behavior may fade out more rapidly, or may be blocked altogether. Other factors, too, may influence conditioning, as we shall see in our discussion of motivation.

Another aspect of conditioning is known as *negative adaptation*,³⁸ and functions both in animals and in human beings. It occurs when a stimulus which would normally bring a certain response becomes ineffectual through too frequent repetition. For example, a vibrating tuning fork was brought near to a spider's web, whereupon the spider dropped from the web ready to attack a supposed fly. After several repetitions, however, the spider would not respond to the tuning fork. Negative adaptation is illustrated, also, by the classic story of the shepherd boy who cried "Wolf!" merely to stir up excitement. When wolves actually did attack his flock, he was unable to secure assistance because everyone had become negatively adapted to his cries for help.

Constant nagging, scolding, and even physical punishment often produce negative adaptation. Parents and teachers who complain that they do not receive cooperation may discover, upon analyzing

³⁷ W N Kellogg and L A. Kellogg, *The Ape and the Child: A Study of Environmental Influences upon Early Behavior* (Whittlesey House, McGraw-Hill Book Company, Inc., New York, 1933), pp 242-243.

³⁸ T R. Garth, *Educational Psychology* (Prentice-Hall, Inc., New York, 1937), pp 126-127.

the circumstances, that they are giving too many commands about trivialities, making too many threats, or issuing orders to the child or adolescent who is legitimately occupied with his own interests.

Like ordinary conditioning, negative adaptation may fade out unless the situation producing it is repeated from time to time. The above-mentioned spider, on the day following the experiment, dropped from its web again when the vibrating tuning fork was brought near.

The *positive phase of adaptation* is shown in the following example. A dog accustomed to sleeping upon a couch in a certain room refused to sleep upon it when it was removed to another room, and for a number of nights preferred the bare floor in the room to which it was positively adapted.

Illustrations common in the experience of parents³⁹ are those of children who become so strongly adapted to certain toys that they insist on taking them to bed. Sometimes when children are accustomed to eating from a particular plate at home, they will not use a strange one when visiting. They may refuse, also, to remove favorite clothes or new shoes at bedtime! Even adolescents may continue to take dolls and Teddy bears to bed with them!

Like connectionism, conditioning as a theory is too narrow to explain adequately all the complicated aspects of the learning process. It attempts to account for the formation of complex habits and skills as the building up of chains of conditioned reflexes. Such an explanation, however, has not been substantiated by laboratory findings. Many of the attempts to explain even simple learning in terms of conditioning have been based upon analogy. This analogical reasoning has not always been justified, because it may ignore factors besides conditioning which are operating in the learning situation.⁴⁰ Both connectionism and conditioning seek to explain an individual's behavior in terms of his past experience. It is possible to show, however, that some phases of learning, while influenced by the past, depend more upon the present circumstances in which the learning takes place. Conditioning, then, may be a useful concept to aid us in understanding some kinds of learning, but in the present state of our knowledge it must be considered inadequate as a general theory.

³⁹ For further discussion read L. C. Wagoner, *The Development of Learning in Young Children* (McGraw-Hill Book Company, New York, 1933), pp. 10-11.

⁴⁰ Hilgard and Marquis, *op. cit.*, pp. 20-21.

WHAT IS THE FIELD THEORY?

In contrast to the two theories of learning which we have just outlined, the field theory stresses the wholeness of the learning process rather than an analysis of its elements.⁴¹ Its advocates claim that it is more than a system of psychology, constituting, in fact, a philosophy of nature. The field theory was developed primarily in Germany during the first part of the twentieth century and was introduced into the United States in the early 1920's. Actually, several psychological points of view are included in the field theory, but they all stress the dominant role of the field or surroundings in which behavior occurs. As illustrations of what is meant by a field, we may cite such diverse examples as the interrelatedness of the parts of the human body, the influence of the family upon its members, and the effect of the classroom situation upon the learner.

Psychological fields are structured or patterned, but this patterning does not depend upon continuity and contiguity alone, as is implied in association theories. In other words, the arrangement of experiences within a field is not governed wholly by the fact that one occurs before or after the other, or near to or distant from it. The degree to which a field may be patterned varies considerably, and the process of learning really involves the progressive organization of a particular field. This organization involves the perception of increasingly meaningful relationships within the field and is called insight. Suppose, for example, that a student is beginning a new course in history. He will have some idea of the general period covered by the course and may know something of the happenings which occur during that time. As he proceeds with a systematic study of the events, however, their significance in relation to each other, and to the whole period, becomes more meaningful. According to the field theory, he is gaining insight into history because the unfamiliar field which was relatively unstructured at the outset is becoming increasingly patterned. The advocates of the field theory do not deny the importance of analysis in the learning process, as is commonly believed. They stress, however, that analysis should come *after* the field has been apprehended as a whole, and that it must be carried out always in meaningful relationship to that whole.⁴² Thus, the

⁴¹ Henry (ed.), *op cit.*, chap. 5 by Hartmann.

⁴² *Ibid.*, chap. 6 by K. Lewin, pp. 217-218 especially.

above-mentioned student, in order to understand history, studies the details *after* he has grasped the general outline, and finds meaning in such details only after he envisages the whole.

The way in which insight takes place has been the subject of considerable discussion. Some psychologists have stressed the *suddenness* with which insight occurs; others have emphasized its gradual nature. Almost everyone has had the experience of suddenly "getting the idea" when solving a problem. Remember, however, that much preparatory thought and experimentation may have preceded this apparently instantaneous clarification of the situation.

Although the field theory denies that learning is determined wholly by an individual's past experiences, it admits that these are of indirect importance in the development of insight. Insightful learning is the product mostly of the present field, but the organization of this field is aided both by previous experience and by the ability to foresee outcomes. Thus, insight is really a combination of hindsight, the present situation, and foresight.⁴³

There also may be different levels of insight, some being on a much more mature plane than others. Even what looks like mere trial and error is, in reality, but the preliminary phase of insightful learning. Such tentative attempts at a solution are not random and meaningless, but may appear so on the surface because they are not yet related clearly enough to the field in which they occur.

Although insightful learning reaches its height in humans, it is present, also, in a less complex form in higher animals. A good illustration of this is the learning experiment which Professor Kellogg⁴⁴ made upon his son, Donald, and Gua, an ape (see Figs. 56 and 57). A cookie was clamped upon a cord which was suspended from the ceiling, beyond the reach of either subject. The only other object in the room was a chair, placed about a meter (39.37 inches) away from the spot where it should be pushed in order to climb upon it to secure the cookie. Preliminary to the experiment both subjects were shown the correct solution. Donald failed on the first three tests, while Gua failed on one of them. The child was able to solve the problem if the chair was always found in the same position. After about a dozen successes Donald used a motor performance rather than a perceptual one, never glancing at the cookie when moving the

⁴³ *Ibid.*, chap. 5 by Hartmann, p. 193.

⁴⁴ Kellogg and Kellogg, *op. cit.*, pp. 213-219.



FIG 56 Donald and the Suspended Cookie Test (From *The Ape and the Child* by W. N. Kellogg and L. A. Kellogg. Copyright 1933 Courtesy of McGraw-Hill Book Company, Inc)

chair. Gua used a varied procedure. When the chair was placed in a slightly different position Donald failed, but the ape, though motor and perceptual means, solved the problem. Throughout the experiment the child was only vaguely aware of the relation of the chair to the solution, whereas the ape perceived the relationship between the chair and the cookie, an example of partial insight. Although, in this case, insight appears to be greater in the ape than in the child, in later experiments Donald surpassed Gua in problem solving, especially after he developed language. Adult humans are far superior to apes in this quality. The animal seems restricted in its ability to resolve learning situations into their elements, and to grasp those which are of greater significance in solving the problem.

In another experiment 44 nursery children between 19 and 49 months of age were confronted with some problems similar to those

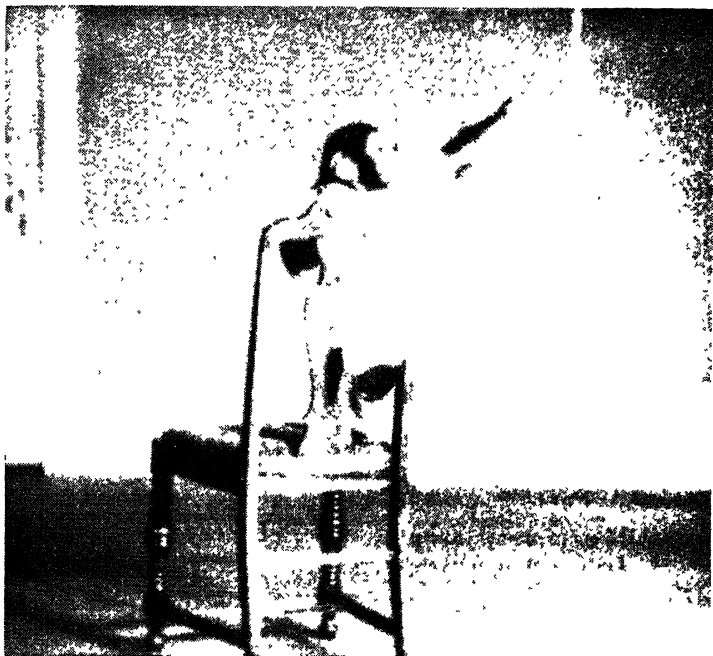


FIG 57. Gua and the Suspended Cookie Test (From *The Ape and the Child* by W. N. Kellogg and L. A. Kellogg. Copyright 1933 Courtesy of McGraw-Hill Book Company, Inc)

which, at one time, had been presented to chimpanzees.⁴⁵ In one instance a toy (a banana had been used with the apes) was removed quite a distance from a play pen where the child was confined. Two sticks were placed in the pen with the child, and these, when fitted together, were of sufficient length to secure the toys. The apes showed partial insight into problems of this type, and some succeeded in solving them. Twenty-five percent of the children in this and similar problem situations made no attempt at solution, but wept or were silent or sullen. Their failure was attributed to "social and emotional immaturity," rather than to lack of learning ability. The remaining 75 percent made either a direct or an indirect attempt. Immediate solutions came "as a result of complete and immediate insight into the problem." When the child did not solve the situation

⁴⁵ A. Alpert, *The Solving of Problem-Situations by Preschool Children*.

immediately, the insight was either gradual or sudden. Chance, without insight, was ineffective. A more recent investigation of the problem solving of preschool children yielded essentially similar results.⁴⁶

In general, insight improves as the child grows older. As most school and college teachers will attest, however, much of the learning of their pupils and students does not represent a very high degree of this quality.

Although the field theory emphasizes the perceptual aspects of learning, some of its proponents stress, also, the significance of emotional, social, and motivational factors. The importance of these is seen in the experiments with nursery school children referred to above.

Although the field theory has not enjoyed such wide popularity in this country as have connectionism and conditioning, it is gaining ground steadily and its influence is being felt in all branches of psychology.⁴⁷ Probably its progress has been retarded somewhat by its employment of unusual and abstruse terminology and its use of complicated geometric diagrams. Perhaps its greatest contribution to a theory of learning lies in its insistence upon the major role played by insight in the building up of meaningful concepts. Its influence is seen, also, in the present trend of liberal arts colleges toward offering orientation or survey courses in broad areas of knowledge, like the humanities and natural sciences, before the detailed study is begun of specific branches of these fields.

On the surface, the three theories of learning which we have considered seem to be quite different. As a matter of fact, however, the apparent differences are not so great as one might think. Each theory stresses a somewhat different phase of learning, but they all agree that it is more than a simple mechanical process, and that some kind of motivation is extremely important. What is needed is a comprehensive, scientific description of *all* the factors in many different learning situations. With such information we might then develop a set of principles which would explain learning in its entirety. This would be more productive than seeking, as we do now, to account for different phases of learning by the formulation of a number of separate theories.⁴⁸

⁴⁶ Bing-Chung Ling, "The Solving of Problem-Situations by the Preschool Child," *Journal of Genetic Psychology*, 1946, 68 3-28

⁴⁷ Henry (ed.), *op cit*, chap. 5 by Hartmann, p. 165.

⁴⁸ *Ibid*, chap. 7 by T. R. McConnell.

WHY IS MOTIVATION IMPORTANT IN LEARNING?

We have seen that drives or motives are necessary in the process of learning because of its dynamic nature. The operation of such drives is not always obvious in some forms of simple conditioning, but it is clearly apparent in more complex conditioning as well as in all types of problem-solving behavior. Certain physiological drives or biogenic needs are common to both animals and man.⁴⁹ These include hunger, thirst, sex, sleep, elimination, exploration, etc. They are set in motion by internal physiological changes and produce restlessness or tension in the organism which persists until an opportunity is provided for satisfying the needs involved. Such drives are commonly used in experiments on animal learning, because they are known to be effective with them, but they are also important motivating forces in human learning. With humans, however, these elemental biogenic needs become so conditioned by social experience that it is often difficult to recognize them. As one writer says, "We . . . do not eat, mate, sleep in any old way, but in certain definite ways with certain objects and in certain places which are mainly prescribed by our social setting, whatever this particular setting may be."⁵⁰ While the mainsprings of both human and animal activity, therefore, lie in the consummation of basic biological drives, human motivation is much more complex. The desire to adhere to the socially prescribed ways of satisfying one's drives becomes a powerful motive in itself. With increasing maturity this sensitivity to the approval or disapproval of the group to which an individual belongs, or of some other person whom he respects or admires, may be a more powerful stimulus than the urge to satisfy a physiological need. This may be seen in the child's desire to please his parents and teachers even if it means the denial of some personal want, like eating between meals or during school hours. The hero worship of the preadolescent and adolescent years illustrates, also, the influence which the approval of an admired individual may have upon behavior. Everyone is familiar with the attempts of youngsters to imitate their heroes and heroines, and sometimes this may be a stimulus

⁴⁹ See E. C. Tolman, "Motivation, Learning, and Adjustment," *Symposium on Recent Advances in Psychology, Proceedings of the American Philosophical Society*, Philadelphia, 1941, 84:543-563.

⁵⁰ M. Sherif, *An Outline of Social Psychology* (Harper & Brothers, New York, 1948), p. 34.

to genuine achievement. A little-known author once presented an autographed copy of one of his books to a small girl. This so impressed the child that the book became a symbol of literary success and caused her to persevere, and eventually win recognition as a writer of fiction.

We shall discuss the nature and function of drives and motives in greater detail in the following chapter. For our present purpose, however, it is sufficient to point out that they are vital to learning. If we wish to secure maximum efficiency in learning, therefore, we must give careful consideration to the motivational aspects of the situation.

The learner himself must feel that the task he is undertaking is worth while, and that his progress represents real achievement. Thus, in the modern school, the teacher has an ideal situation for learning when the pupil is interested whole-heartedly in what he is doing, and is made to feel that he is a successful member of his group. In such circumstances the motivation is intrinsic, that is, it arises naturally out of the individual's interest in the activity. Hence, there is no need for the use of extrinsic motives, such as prizes, honor rolls, monetary rewards, etc., which have no *real* connection with the task to be mastered. Extrinsic types of motivation have been and still are used widely as aids to achievement. The chief criticism of them is that they center the attention of the learner upon the reward rather than upon the total learning situation. Even though they may seem to be expedient, they are not effective in the long run, because they separate the motive for learning from the learning itself. This dichotomy of the learning situation destroys its unity and wholeness, which is considered so important in more recent theories of learning.

The question concerning the relative effectiveness of positive and negative motivation has been the subject of much discussion and research. The general conclusion has been that praise is superior to blame, and that pleasant outcomes secure better results than pain or punishment.⁵¹ Both teachers and parents frequently violate this principle, however, when they scold or punish children in an effort to improve their school accomplishment. Even the busy commuter takes time to find fault with his children's school work. "He addresses the egggy little faces grouped about him on the subject of

⁵¹ E. B. Hurlock, "The Value of Praise and Reproof as Incentives for Children," *Archives of Psychology*, 1924, 71.

their lousy school reports. He has come to the end of his patience."⁵²

Two comparatively recent investigations provide further interesting information on this topic. In one of these studies 234 children from grades 3, 6, 9, and 12 were given verbal reproof in connection with a task in arithmetic reasoning and one in a motor skill. For purposes of comparison they were matched with a control group who performed the same tasks, but who were not reproofed. Results showed that in the arithmetic reasoning task, reproof impaired performance in grade 3, improved it in grade 6, and had slight effect in grades 9 and 12. For the motor task, reproof improved performance in grades 3 and 6, impaired it slightly in grade 9, and produced little change in grade 12. In general, "this study disclosed that, at about age nine, reproof impaired performance on an arithmetic task and improved it on a motor task; at about age 12 reproof improved performance on both tasks; at about ages 15 and 18, reproof had little effect on performance of either task."⁵³

In another investigation 54 sixth-grade pupils were given a simple learning test consisting of locating correctly designated holes in a puzzle board.⁵⁴ Three types of statements were used in commenting on the children's performances. These were classified as: positive or praise; negative or reproof; and neutral, involving neither praise nor blame. The order in which the task was presented was highly significant; the performance was always poorest on the first trial and was best on the last trial, showing some practice effect. On the basis of first trials, positive statements were most effective. Negative statements brought the next best results, and neutral statements had the least effect.

The subjects, also, were given three standard personality tests, and their ratings on these scales were compared with their reactions to the different types of verbal approval mentioned above. It was found that those who were better adjusted responded best to positive appeals, whereas those who were maladjusted responded more to neu-

⁵² E. Streeter, *Daily Except Sundays* (Simon and Schuster, New York, 1938), pp. 18 and 20.

⁵³ E. H. Potter, "The Effect of Reproof in Relation to Age in School Children," *Journal of Genetic Psychology*, 1943, 63:247-258, especially p. 258.

⁵⁴ G. L. Grace, "The Relation of Personality Characteristics and Responses to Verbal Approval in a Learning Task," *Genetic Psychology Monographs*, 1948, 37:73-103.

tral or negative appeals. It was concluded, therefore, that "different kinds of children respond differently to various kinds of verbal reinforcement,"⁵⁵ as is shown in the following thumbnail sketches.

The child who responds best to the positive statements might be characterized as being a "good" child who gets along well at school and at home. He seems to feel a need for social approval and acceptance. He shows leadership qualities and shows a healthy interest in other individuals. He is relatively stable emotionally and is a generally secure child.

The child who responds best to neutral statements is probably an insecure child. He shows tendencies toward feelings of personal inferiority. His poor school and home adjustment may possibly be due to overcompensation for these inferiority feelings. He seems to be interested in others and in their opinions of him. Some degree of leadership qualities and emotional stability also seem to be indicated.

Those who respond best to negative statements exhibit at least two contrasting types of adjustment. One type is the well-adjusted but overly conscientious child who tries very hard to please authority in both the school and the home. The other type is very poorly adjusted. This child doesn't get along well with others, although he seems to feel a deep need for social approval and acceptance. He has many problems of adjustment in both the home and the school. He is submissive and tends to be either anti-social or else a follower in group activities. He is primarily interested in himself and shows tendencies toward emotional instability.⁵⁶

From the foregoing research, it is apparent that the effect of motivating factors, like praise and blame, cannot be stated as invariable principles of learning which will apply with equal force to all individuals at all ages and in all types of circumstances. What spurs on one individual to greater achievement may discourage a second and have no effect upon a third. Each learner has his own set of values, which are derived principally from both his home and his school background. There is great individual variation in level of aspiration or ambition. For example, what one student regards as satisfactory accomplishment another may consider as near failure. In seeking to motivate the learner, therefore, we must consider not only the more obvious biological and social drives but also the way

⁵⁵ *Ibid.*, p. 99.

⁵⁶ *Ibid.*, pp. 98-99. Reproduced by courtesy of Dr. Carl Murchison, Treasurer, The Journal Press, 2 Commercial Street, Provincetown, Mass., publisher of *Genetic Psychology Monographs*.

in which he responds and adjusts individually to values and pressure of the groups to which he belongs.

WHAT OTHER FACTORS AFFECT LEARNING?

In addition to motivation and the numerous other conditions which, as we have seen, complicate the learning process, there are several other factors influencing learning to be considered in this section. These are the relation of learning to: (1) age, (2) sex, (3) health and physical condition, and (4) social and economic background.

WHAT IS THE RELATIONSHIP BETWEEN LEARNING AND AGE⁵⁷

We have already had several occasions to mention the fact that learning is evident in very early infancy and may begin even before birth. It is hard to measure the development of this early learning, however, because of the difficulty of devising suitable experimental techniques. Although there are some studies of the relationship of age to learning during the preschool period, the bulk of the material on this topic is concerned with the ages of six and beyond.⁵⁸

An important index of learning is the extent to which an individual remembers what is learned. This usually means not only the retention of such material but the ability to recall and reproduce it as well. An illustration is the so-called memory span, referring to the amount of material, either rote or meaningful, which can be reproduced after a certain number of repetitions. Examples are the tests of memory for digits which we noted in connection with the measurement of intelligence. Notwithstanding the diversity of materials and conditions employed by different investigators, the data show a steady growth of memory span, although the amount of increase from year to year is small. The child of five, for instance, may be able to repeat four digits correctly, whereas the adult often can repeat seven or eight. From the ages of 8 to 16 or 18, a similar upward trend is observed for all types of material, both meaningful and meaningless, such as vocabulary, geometric forms, and nonsense syllables.

The ability to memorize poetry increases between the ages of 7 and 18, and recalling ideas from prose selections shows a uniform gain from ages 8 to 13 for boys and 8 to 15 for girls.

⁵⁷ J. A. McGeoch, *The Psychology of Human Learning*, chap. 6.

⁵⁸ *Ibid.*, p. 208.

In such perceptual-motor abilities as maze learning and card sorting there is a decrease in errors and a reduction in the time required to perform the task from eight years to late adolescence or early maturity.

It has been found, likewise, that problem-solving ability improves as age increases, from three years to the university level. This is true for both the learning of abstract concepts and the solving of ideational problems.

There are interesting qualitative differences, too, in the learning of individuals at different age levels.⁵⁹ Younger, as compared with older, children are less cautious in approaching a task, and are more impatient. With increasing age they become more systematic, and their experiences become more meaningful to them. We may conclude, therefore, as one writer does, that "the data leave no doubt that over a very wide range of activities there is an increase in measures of learning, under equal or nearly equal conditions, with increasing age during the first two decades of life."⁶⁰

ARE THERE SEX DIFFERENCES IN LEARNING?⁶¹

Much discussion has centered about the question of sex differences in relation to learning, and many investigations of this problem have been made. In some studies, however, either the groups were not carefully selected or there were too few cases to justify the conclusions reached. There is still conflicting evidence on the relative learning ability of boys and girls at different age levels. Such differences as are found, however, are small, and a great deal of overlapping exists. Moreover, as we saw in the case of measurable intelligence, there is greater variability in learning within each sex than there is between the sexes.

The kind of material learned and the type of motivation involved probably account to a large extent for apparent sex differences in learning. In other words, boys tend to learn better those things in which they are especially interested, and girls, likewise, excel in activities which they like, and which are related to their experiences. Since these differences diminish when equal opportunities for practice are given, it may be concluded that they are due mostly to social and cultural factors, rather than to biological differences.

⁵⁹ *Ibid.*, p. 225.

⁶⁰ *Ibid.*

⁶¹ *Ibid.*, pp. 241-246; Kingsley, *op. cit.*, pp. 325-326.

Available data do not support the frequently made generalization that, because of their earlier maturity, girls are superior to boys in learning up to adolescence, and that this superiority declines thereafter. As noted in Chapter 4, girls are ahead of boys in anatomical growth, and this developmental acceleration probably has some effect upon school achievement. It should be remembered, however, that school success is not a matter of learning ability alone. Social and emotional adjustment also are vital factors in normal educational progress, and these undoubtedly are influenced profoundly by differences in anatomical and physiological development.

It is evident, then, that neither sex is inherently superior in rate of learning. The slight differences which may exist probably are due to differences in materials, motivation, and environmental background.

HOW DO HEALTH AND PHYSICAL CONDITIONS AFFECT LEARNING?

Although it seems obvious that health and physical conditions have a great influence upon learning, this fact is still neglected by some parents and teachers.

We have commented already upon the importance of nutrition and other physiological factors, such as glandular function, in relation to school adjustment. It is clear that the undernourished or anemic child, or the one suffering from glandular imbalance, not only will have difficulty in mastering school tasks but is likely to exhibit undesirable social and emotional behavior as well. The same can be said of the child with serious physical defects, such as impaired vision or hearing, crippling and heart conditions, diseased teeth, tonsils, and adenoids, etc.

In the health program of most modern schools periodic physical examinations are given to all pupils in order that such defects may be discovered as early as possible. Treatment generally is administered for correctible conditions, but if these are irremediable, special educational facilities often are provided. Thus, sight-saving classes⁶² are organized in many school systems to take care of children whose vision is too limited for ordinary kinds of instruction, or who cannot participate in regular school work without endangering their sight. Similar provisions are made, also, through special classes

⁶² R. V. Merry, *Problems in the Education of Visually Handicapped Children*, Harvard Studies in Education, No. 19 (Harvard University Press, Cambridge, Mass., 1933).

or schools for other types of handicapped children, like the deaf and hard of hearing, the crippled, and those with cardiac or tuberculous conditions.⁶³

Illnesses of various kinds are important, too, in their effect upon learning. A large proportion of children suffer from respiratory troubles, such as colds and influenza, and communicable diseases, like measles and chicken pox. Obviously, pupils who are suffering from, coming down with, or recovering from such illnesses are not in a condition to do justice to their school work. They may be feverish, irritable, and restless, or depressed, lethargic, or indifferent. It is vital that the teacher should be able to recognize the symptoms of common childhood diseases in order to assist in their prevention and control. To help in this, charts or booklets listing such symptoms are sometimes prepared and distributed by state departments of health.⁶⁴

The psychological significance both of physical defects and of temporary or chronic illnesses must not be overlooked.⁶⁵ In the final analysis, the seriousness of a handicap depends largely upon the attitude which the individual takes toward it, and also upon the way in which others regard him. If he feels inferior, sorry for himself, or entitled to special privileges, his adjustment will be difficult. Similarly, if he is excluded from group activities, regarded as "queer," or considered a "sissy," his chances for normal social and emotional development are limited. It cannot be overemphasized, therefore, that the physical and psychological effects of health and physical conditions are of paramount importance in both formal and informal learning situations.

HOW ARE DIFFERENCES IN SOCIAL AND ECONOMIC BACKGROUND RELATED TO LEARNING?⁶⁶

With the present emphasis upon the wholeness of the learning situation, there is an increasing tendency to consider the effect of the learner's social and economic background upon his performance.

⁶³ Consult H. J. Baker, *Introduction to Exceptional Children* (The Macmillan Company, New York, 1944).

⁶⁴ An excellent chart of this type is distributed by the Department of Public Health, State of West Virginia, Charleston, West Virginia.

⁶⁵ H. N. Rivlin, *Educating for Adjustment* (Appleton-Century-Crofts, Inc., New York, 1936), chap. 7.

⁶⁶ A. Davis, "Child Training and Social Class," in Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 34, also A. Davis and R. J. Havighurst, *Father of the Man* (Houghton Mifflin Company, Boston, 1947).

As we saw in Chapter 4, the nutritional status of children from the lower socioeconomic brackets is likely to be inferior to that of children from better-class homes. This, as noted in the preceding section, has an indirect relationship to their school achievement.

In addition to differences in physical environment, the widely varying types of attitudes and values existing in homes of different social-economic levels have a profound effect upon academic progress. For instance, people from the lower classes often resent those who are educated, particularly if they use acceptable English. Much of the school program is looked upon as a waste of time, as is also the reading of books and magazines, and other intellectual activities. Such an outlook is in sharp conflict with that which the school is seeking to promote, and cannot help but be reflected in the child's behavior and attitudes toward his work.

The middle and upper classes, however, are much more favorable toward organized education. In fact, the American public school represents primarily the embodiment of middle-class standards and ideals. Children from middle-class homes, therefore, are not likely to experience much conflict between parental attitudes and those which they encounter in school. Their parents usually encourage reading and similar intellectual interests, and make children feel that school attendance and the obtaining of good marks are highly desirable. This relationship between learning and parental attitudes and values is well illustrated by a recent comparative study of children enrolled in a nursery school in the Tennessee mountains and a group of the same age in a similar type of school in Greenwich Village, New York.⁶⁷

Most elementary and high school teachers are familiar, also, with pupils from homes which are not in sympathy with what the school is trying to accomplish. The writers know of a case of a factory worker, none of whose eight children was permitted to attend school beyond the eighth grade, although they were doing excellent academic work and were eager to continue their education. They were forced to take routine jobs and were unable to get very far vocationally because of their limited schooling and lack of special training.

If a student persists in acquiring an education beyond the level which the home considers desirable, he may find himself rejected

⁶⁷ C. Lewis, *Children of the Cumberland* (Columbia University Press, New York, 1946).

by the social class to which he belongs. This is illustrated by the experience of a girl from a foreign home of the lower class. By determined efforts she secured a high school education against the opposition of her family, who wished her to marry a young man of similar background. Friends, who recognized her ability, made it possible for her to attend college, where she graduated with a better than average record. In doing this, however, she alienated herself completely from her family, who felt that she was trying to be "high hat." She has had difficulty, however, in gaining social acceptance by the middle-class group of which she wishes to become a member, because of the persistence of certain characteristics of her lower-class background.

We shall discuss the question of social development more extensively in a later chapter. Differences in social background are so important in relation to learning, however, that it was considered necessary to mention them at this point.

GENERAL CHARACTERISTICS OF LEARNING

Although the learning process is extremely complex, it has certain general characteristics, an understanding of which is helpful in practical learning situations. The course of learning in any specific task may be represented graphically by what is known as a learning curve.⁶⁸ In constructing such a curve, practice periods usually are represented by units along the horizontal axis or base line, while rate of progress is shown on the vertical axis or ordinate. This is not an invariable rule, however, since the relationship between practice and progress may be indicated conversely, that is, with amount of practice shown on the ordinate and rate of progress on the base line.

Although there is no one curve which is representative of the learning of all tasks by all individuals under all circumstances, certain kinds appear more frequently than others. Three of the most common types of learning curves⁶⁹ are presented in Figure 58. Curve A illustrates the kind of learning which is familiar to many students. It shows rapid initial progress with a decrease in rate as time goes on. This initial spurt, as it is often called, may be due to the novelty of the

⁶⁸ McGeoch, *op. cit.*, chap. 2; and Kingsley, *op. cit.*, chap. 9.

⁶⁹ E. A. Bond, "The Learning of Children," in Skinner and Harriman (eds.), *Child Psychology* (The Macmillan Company, New York, 1941), chap. 9.

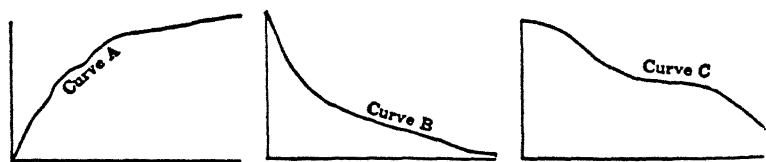


FIG 58. Representative Learning Curves. (From C. E. Skinner and P. L. Harriman, eds., *Child Psychology*, p. 210. Copyright, 1941, by The Macmillan Company. Used by permission of The Macmillan Company, publishers.)

task, to the fact that it fits in with the learner's interests and ambitions, or to previous experiences which help him in this relatively new situation. In curve B, the falling line represents the progressive elimination of errors as practice is continued. C is an hypothetical curve which is a composite of those found in many learning experiments. An important characteristic observed to a greater or lesser extent in most learning curves is a place where no apparent progress is made. This flattening of the curve is known as a plateau. The frequency and length of plateaus can be lessened by strong motivation or by the introduction of new methods, but they usually cannot be eliminated altogether. It may be questioned, also, whether no advancement in learning actually is taking place simply because no measurable progress is shown. The realignment and reorganization of experience may very well be going on during this latent period, and the fact that unusually rapid progress resulting from new insight often occurs immediately after a plateau supports this belief.

Learning curves may take either of two general forms, as the end of the learning period is approached. There may be what is called an *end spurt*, wherein a final sharp rise in learning is noted. On the contrary, progress may decline gradually until the curve has nearly flattened out by the time practice is completed. In the latter case, the interesting question of physiological limits arises. Presumably, the learner reaches a point eventually where further progress is impossible, despite repeated practice. This seems to be true, especially, in the acquisition of perceptual-motor skills like typing or telegraphy, where the individual apparently reaches his physiological limit for speed and accuracy. It is the general belief of psychologists, however, that except in rare instances people seldom or never reach the limits of their learning abilities or capacities. Most of us are content with a performance which is "good enough" or which "gets by," because we lack the energy and drive to persevere in the face of dimin-

ishing returns. Thus, when we say that a performance is the best we can do, we are likely to mean that it is the best that we are willing to do.

From what has been said, it is evident that progress in learning is extremely uneven and irregular. Both teachers and students should bear this in mind in evaluating performance. The course of learning, like that of true love, "never did run smooth," and it cannot be expected that accomplishment will be equal at all times. It may be of some encouragement to the learner who is on a plateau, however, to remember that, if he will persist, a marked improvement in his progress is likely to occur, unless he is nearing his physiological limit.

WHAT IS TRANSFER OF TRAINING?⁷⁰

Most people are aware that the skills, knowledge, or attitudes acquired in one situation have some effect upon performance in other situations. In psychology and education this influence of one learning experience upon another is known as transfer of training. If learning in one field facilitates learning in another it is called *positive* transfer, but if learning one thing inhibits or interferes with learning another, it is regarded as *negative* transfer. When it is impossible to ascertain the effect of one learning situation upon another, the transfer is said to be *indeterminate*.

Driving an automobile has been used frequently as an example of the *positive* transfer of skill. If one learns to drive a certain make of car, he usually is able to drive other makes with comparatively little practice. This is because the same general kinds of motor coordinations and other habits are used in driving all cars, despite minor differences in type and location of controls. If these differences are too great, however, *negative* transfer may result, as many drivers of old Model T Fords found when they changed to cars with standard gear-shifts. Similarly, when a student of psychology and education applies his knowledge to the training of children or to an actual learning situation in the school, *positive* transfer has occurred. It happens frequently, however, that those who attempt to study French and German simultaneously experience *negative* transfer largely because of differences in grammatical structure and word order in the two languages. Illustrations of the transfer of attitudes may be seen where a student who likes the English teacher may choose that sub-

⁷⁰ McGeoch, *op. cit.*, chap. 10, Kingsley, *op. cit.*, chap. 19.

ject as a major study, whereas one who dislikes the instructor in mathematics may dislike or avoid subsequent courses in this field. Not only are choices of school and college programs influenced in this way, but also the selection of vocations and the manner in which an individual uses his leisure time.

There are, of course, many instances of learning in which no measurable transfer takes place. It is probable, nevertheless, that there are few, if any, learning situations which are not affected in some way by transfer. Even when an individual begins what seems to be an entirely new task, he does not start from zero. The background of skills, knowledge, and attitudes which he possesses certainly affects the way in which he attacks a new problem, and will determine to some extent how successful he is in meeting the new situation. It is apparent, therefore, that one of the major objectives of organized education is to secure as much positive transfer as possible, both from one school activity to another, and more particularly from the classroom to life experiences. Without transfer, insightful learning and creative thought would be impossible, and all our educational efforts would be futile.

There has been a great deal of controversy over the nature of the conditions which promote transfer. When faculty psychology was popular, as noted in the preceding chapter, it was believed that the exercise of any mental faculty would strengthen it, so that it would function better in any kind of situation. Thus, if one "trained" his memory by learning poetry, he would be able to remember all kinds of material more easily, and if he exercised his "reason" with problems in arithmetic and geometry, his ability to solve *all* types of problems would improve. This doctrine of formal discipline, as it was called, has now been abandoned, since it has been shown that the "mental faculties" which it presupposed do not exist.

Another theory which has been suggested to account for transfer is that of so-called identical elements.⁷¹ According to this view the degree of transfer between two learning situations depends upon the existence of elements which are common to both. One would expect, therefore, to find a large amount of positive transfer between physics and chemistry, or literature and history, because of the great number of identical elements in these subjects. Less transfer could be obtained between history and chemistry, however, because they have

⁷¹ Thorndike, *op cit.*, p. 269.

fewer elements in common. The existence of identical elements does not necessarily guarantee transfer. The learner himself must recognize these common factors and actively make use of them.

It has been suggested more recently⁷² that it is not so much the separate elements in a situation which are responsible for transfer as the way in which they are organized. For instance, it is not the similarity of details which enables us to drive other cars after we have learned to drive one. It is rather the integration of the separate habits and skills involved into a functioning whole which transfers, despite minor alterations. This transfer by wholes will work satisfactorily unless differences in detail are so great as to necessitate complete reorganization.

There is a close relationship, also, between transfer and the ability to generalize. If an individual cannot carry over knowledge and skill from one situation to another unless the second is exactly like the first, the possibilities of transfer are limited. When he is able, through generalization, to abstract the basic principles involved in solving one kind of problem and to apply these to the solution of other problems, transfer is operating on its most effective level. Because there are wide individual differences in ability to generalize, we cannot expect everyone to show equal amounts of transfer. It is possible, nevertheless, to improve positive transfer by teaching techniques and other methods for the guidance of learning. For example, teachers who call attention constantly to the similarities between various subjects and activities will secure more transfer than those who do not. Greater emphasis upon general principles and their wide applicability promotes transfer, as does also the use of abundant illustrative material from a variety of sources. The nature of the content to be learned, likewise, has much to do with the problem of transfer. Some materials and activities lend themselves more readily to transfer than do others. This is an important problem in curriculum building. Some educators feel that subject matter which does not have broad transfer value should not be included in the school program. Others believe that certain content may have value even if its possibilities for immediate transfer cannot be demonstrated easily. This is really one of the basic issues in the controversy between those favoring general or liberal education and those supporting practical or utilitarian education.

⁷² Henry (ed.), *op. cit.*, p. 184.

INDIVIDUAL DIFFERENCES IN LEARNING

Throughout this chapter we have pointed out frequently that wide individual differences exist in the various phases of learning. Traditional school procedure frequently ignored these differences by assuming that all members of a class possessed equal learning capacity. In the modern school, however, an attempt is made to appraise the learning capacities of each individual and to diagnose his special abilities and disabilities. In this way his work can then be adjusted to his individual needs. A common procedure in both elementary and high schools is to group together pupils with similar abilities for instructional purposes.

The attempts of the school to cope effectively with problems arising from individual differences in learning must be supported by parental understanding and cooperation. Too frequently overzealous parents constantly stress differences in achievement among their children, holding up the high marks obtained by one child as a model to the other. Such a procedure is discouraging to the child whose achievement is less outstanding, and often overlooks the fact that he has accomplishments in other fields which are equally valuable. Jealousy and similar undesirable attitudes within the family may also result from such disregard of individual differences. The case of B. H., a boy of 10 years with normal intelligence (I.Q. 92), illustrates how even serious problems may result when the superior accomplishment of one child is used as a model for another.

B. H. showed a history of stealing money since the age of five years, and in general the amounts taken gradually increased. The first episode was probably due to a desire for popularity, since he was not liked by other children and he thought he would win their favor by "treating" them to ice cream and candy. The later episodes, however, were traced to the boy's desire for attention. He was very jealous of a brother two years younger than himself who was well-liked, popular in school, and brought home excellent reports. The parents constantly drew unfavorable comparisons between B. H. and his brother, not only as to school progress, but also as to his attitudes and social adjustment. As a consequence, B. H. developed an air of bravado and resorted to stealing and other forms of asocial conduct in order to get attention at home and in the neighborhood.

How to deal adequately with individual differences in learning capacity is one of the major instructional and administrative problems

in present-day education. A complete solution is still to be found, but the increasing recognition of its significance by both parents and educators is encouraging

HOW TO MAKE LEARNING MORE EFFECTIVE

Despite individual differences and the lack of agreement which we have observed among the various theories of learning, there are certain fundamental principles which experience has shown to be of value in making learning more effective. By effective learning we mean not only its speed and efficiency but its permanence as well. Most of the knowledge and skills which we are required to learn, also, have to be retained and recalled when needed; otherwise the time and effort expended upon learning are largely wasted. Forgetting is an important factor both in the school and in the home and is often a source of disturbance to teachers and parents. It has been shown that forgetting is rapid at first and then proceeds more slowly. No individual can remember everything he learns, and the amount retained depends upon a number of different factors. Fortunately, however, most of the conditions which make learning efficient tend, also, to make it permanent.

The principles enumerated below are of practical value in the improvement of learning. It is assumed that the learner possesses necessary skills, such as speed and comprehension in reading, and that he has reasonably favorable environmental conditions for learning: that is, freedom from distractions, good lighting and ventilation, and access to proper materials.⁷³

1. *A favorable attitude.* Perhaps the most important factor in effective learning is that the individual shall feel that his task is worth doing. Good learners find their work interesting and are not bored with it, while the contrary is true of poor learners.⁷⁴

2. *Meaningfulness.* The degree to which the material to be mastered is meaningful is important, also, in good learning. The learner should have a clear conception of the ideas he is trying to assimilate, and should be able to apply them in his own experience. This generally is made easier by

⁷³ For suggestions on how to study consult R. W. Frederick, C. E. Ragsdale, and R. Salisbury, *Directing Learning* (Appleton-Century-Crofts, Inc., New York, 1938); also C. Bird and D. M. Bird, *Learning More by Effective Study*

⁷⁴ H. D. Carter, "Methods of Learning as Factors in the Prediction of School Success," *Journal of Psychology*, 1948, 26:249-258.

HOW WE LEARN

organizing ideas into larger wholes, thus emphasizing the relationship between them.

3. *Vividness*. Usually, the more intense or vivid an experience is, the more easily it is learned and remembered. Aids to vividness are charts, graphs, pictures, movies, and similar visual materials.

4. *Opportunities for use*. Both learning and remembering are facilitated by frequent opportunities to use the knowledge or skill learned in everyday experience. In other words, opportunities for transfer assist learning.

5. *Frequent and strategic reviewing*. Because of the rapidity with which material is forgotten, frequent reviewing at strategic points is essential, that is, at the end of a logical unit, or just before the data are to be used.

6. *Overlearning*. The permanence of learning is increased considerably by overlearning, which is the continuance of practice beyond the point of immediate recall. This means that the learner should keep on going over important facts or principles even after he can reproduce them correctly, but not to the point of boredom.

The mere recognition of these principles will not, of course, improve learning. The learner must believe in them and put them into active practice.

Contrary to the popular conception that childhood is the "Golden Age of Learning," it has been found that this is not true. Up to middle age there is no appreciable loss in learning ability, but merely a decrease in enthusiasm and the desire for new experiences. From these data it might be well to suggest that we do our learning while we still retain the enthusiasm of youth.

SUMMARY

The improvement made by an individual in adjusting to environmental situations may be called learning.

The term "maturation" generally is employed to describe natural growth changes, while "learning" refers to behavior resulting from environmental conditions.

Learning and intelligence are not always easy to distinguish, but learning usually means *acquired* experience, whereas intelligence refers to the individual's *capacity* to acquire such experience.

Perception develops gradually and is an important determining factor in learning. As soon as the infant can give meaning to his sense experiences, then perception has begun, and little progress in learning occurs until this time.

Orientation in time and space is a basic factor in perceptual learning and develops according to a definite pattern.

Attention is another important aspect of perceptual learning, and both its duration and its span increase with age.

The various phases of perceptual development form part of the necessary background for thinking. In general, thinking is synonymous with the solution of problems, and Dewey's steps in problem solving have been employed widely as aids to improved thought.

The ability to grasp cause-and-effect relationships is necessary in thinking. Although Piaget believes that children follow definite maturational stages in developing ideas of causality, this is not confirmed by an American investigator who found that causal thinking is influenced more by school training than by maturation.

Adults sometimes doubt the ability of small children to reason, but many illustrations show that they can and do reason within their range of experience.

We have discussed three representative theories of learning: (1) connectionism, (2) conditioning, and (3) field theory.

Connectionism stresses the establishment of neural bonds between stimulus and response. This theory led to the formulation of certain laws which were supposed to govern the learning process: the Laws of Exercise, Effect, and Readiness.

Connectionism also stresses trial-and-error learning, in which the correct reaction to a problem situation is gradually singled out from random responses. In this type of learning the goal and drive are important factors. Problem solving is trial-and-error learning with ideas rather than with objects.

In conditioning there is a shift from the original natural stimulus to one associated with it. Negative and positive adaptation are two forms of conditioning. In the first the stimulus loses its effectiveness through too frequent repetition; in the second the stimulus is so effective that it is very difficult to separate it from the accompanying response.

The field theory emphasizes the wholeness of the learning process rather than an analysis of its elements. It holds that really effective learning is through insight, or the ability to grasp relationships between the various elements in a problem situation. Insight may take place on different levels, and although it is found in animals, it

reaches its highest form in man. It may be sudden or gradual, and what appears to be trial and error may be but a preliminary stage of insight.

Drives or motives are necessary in the process of learning because of its dynamic nature. Organic drives, such as hunger, thirst, and sex, operate both in man and in animals. With humans, however, these biological urges become so conditioned by social experience that it is often difficult to recognize them.

Intrinsic motivation usually gives better results than extrinsic, but there may be exceptions. Although praise seems to be better than reproof, this is not true under all conditions and with all types of individuals.

Learning is affected greatly, also, by age, sex, health and physical condition, and social and economic background.

The progress of learning may be represented graphically by what is known as a learning curve. There is no one curve which is representative of the learning of all tasks by all individuals under all circumstances. However, most curves show that learning is uneven and irregular, characterized by spurts and plateaus. There may be a physiological limit to learning, but few reach it.

The way in which one learning situation affects another is known as transfer of training. It may be positive, negative, or indeterminate. It is probable that some transfer takes place in all types of learning, even though it cannot always be measured.

Theories which have been suggested to account for transfer are: the presence of identical elements, and the application of organized experiences. Transfer is influenced markedly, also, by the learner's ability to generalize.

The existence of wide individual differences in learning capacity is of great significance in both home and school adjustment.

Both the efficiency and the permanence of learning depend upon: a favorable attitude, meaningfulness, vividness, opportunities for use, frequent and strategic reviewing, and overlearning.

Emotional experience is inextricably bound up with learning. Not only is learning influenced by emotional factors, but the expression of feeling and emotion is determined, also, to a great extent by learning. How emotions develop, therefore, and how we gain control over them will occupy our attention in the next chapter.

SUGGESTED ACTIVITIES

1. Contact a preschool child and check on his ideas of time and space, using questions taken from the studies cited in this chapter.
2. Apply the Dewey analysis to a problem of your own, and outline it by steps. (You will find detailed suggestions in Chapter 24 of *Directed Learning* by Frederick, Ragsdale, and Salsbury.)
3. Consult Piaget's book, *The Child's Conception of Causality*, and give some of his questions to children of your acquaintance, reporting your results to the class.
4. Report to your class illustrations showing that small children can reason within their range of experience.
5. Prepare a written report interpreting one of your own learning experiences from the standpoints of connectionism, conditioning, and field theory.
6. Report an instance from your own experience in which insight played a dominant role in learning.
7. From a visit to an elementary school and a high school, and from your college experience, make a list of extrinsic and intrinsic types of motivation which you observed. Note, also, the use of positive as compared with negative motivation and comment upon their relative effectiveness.
8. Construct a learning curve of your progress in one of your college courses, and discuss it from the standpoint of the material given in this chapter.
9. Visit a high school class in English, history, or science and report on the methods used by the teacher to secure positive transfer.
10. Give instances of negative transfer from your own learning experience.
11. Appoint a committee to find out from local school authorities what provisions are made for individual differences in learning capacity.
12. Secure a copy of C. G. Wrenn's *Study-Habits Inventory*, sold by the Stanford University Press, Stanford University, California, and use it to evaluate your own study procedures.

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CHAPTER 9

HOW WE GAIN EMOTIONAL MATURITY

WHAT IS AN EMOTION?

Most of us are able to recognize the general characteristics of emotional experience in ourselves and, to a lesser extent, in others. Our everyday speech is filled with references to fear, joy, love, sympathy, jealousy, anger, hatred, and the like, and such terms usually are accepted uncritically.

A large proportion of our everyday problems are of an emotional nature. Nevertheless, little scientific knowledge concerning the origin and development of emotional experiences was available until comparatively recent years. This was due to the general belief that emotions could be studied only through introspection, that is, by having the individual describe how he feels when he is afraid, angry, etc. This technique, obviously, was unsuited to small children because of the unreliability of their reports and the impossibility of checking them.

In order to provide a background for understanding the development of emotions and methods of controlling them, we shall first consider briefly the *general* nature of emotional response.

Emotional experience is perhaps an outstanding illustration of the saying that "what everyone knows, no one knows." Despite its universality, it is very difficult to define, and its study has been one of the most complicated tasks of psychology. A major problem in the scientific study of emotion is its subjectivity. Emotions are "felt," and

when we ask even an adult to describe his feelings during an emotion, he frequently finds it impossible to do so accurately.

As we shall see presently, emotional experience is accompanied by marked physiological changes, some of which can be observed and measured objectively. They are widespread or diffused, their effect being felt by the individual, not in any one part of the body, but as a *general* "stirred-up" state. For many years it was believed that these changes were the *true* basis of emotion. One theory¹ held that overt reactions, like running away or fighting, gave rise to the emotional experiences of fear and anger. The classic illustration of this is the case of a man walking through the woods who suddenly encounters a bear. He follows his impulse to turn and run, and the act of running away makes him feel afraid. In other words, his fear *results* from his action, rather than his action's being the result of fear. Such an explanation of emotion, however, has proved to be inadequate. Actors portray the outward manifestation of emotions without really experiencing them. A belligerent attitude and posture may seem to reinforce anger, but they will not in themselves produce rage.

Other theories attributed emotions to physiological changes, such as variations in pulse rate, breathing, and digestion. According to them, it is the palpitating heart and irregular breathing which cause us to feel angry, afraid, etc. Recent research has shown, however, that these physiological changes accompanying emotional states are not well differentiated for different emotions. The objective measurement of such changes, therefore, would not in itself be enough to tell whether one was angry or afraid. It is possible, also, to create artificially, by the administration of drugs and other methods, physiological changes similar to those which accompany emotion, but these do not produce *true* emotional response. It seems clear, therefore, that emotional experience does not depend upon physiological changes. Instead, these changes accompany emotional experience and probably reinforce the individual's ability to deal effectively with the emotion-provoking situation.

Emotion, then, appears to be primarily a psychological reaction, and the nature and quality of this response seem to be determined mostly by the circumstances involved. When, for instance, the individual faces a situation for which he has no ready and adequate re-

¹ The James-Lange theory. Read C. A. Ruckmick, *The Psychology of Feeling and Emotion*, chap. 6

sponse, an emotion, usually called fear, results. The intensity of the emotion, which may vary from momentary uncertainty to acute fear, will be determined largely by the degree of unfamiliarity of the surrounding conditions and the rapidity with which the individual is able to adjust himself to them. Thus, chronic fear or worry results from circumstances containing certain elements for which the individual remains unable to find a satisfactory solution.

Again, when one finds himself thwarted, he usually experiences the emotion of anger. Here, too, the intensity of the emotion and its duration will be determined largely by the nature of the conditions involved.

The emotion of love is generally conceded to be the psychological response associated with the sex drive. The psychoanalysts believe that all forms of love have essentially a sexual basis. Whether this is wholly true or not, the love emotion is generally evoked by a situation containing someone or something for which the individual feels affection.

The pleasantness or unpleasantness of an emotion seems to be determined by its strength or intensity; by the nature of the situation arousing it; and also by the individual's interpretation of that situation. Intense fear and anger are generally unpleasant, but mild fear provides many of the "thrills" associated with modern amusements. "Righteous indignation" is an example of pleasantness associated with anger. The love emotion may even become unpleasant if too intense, especially if connected with fear.

Although the nature of the situation undoubtedly plays a major part in determining the kind and intensity of emotions which we experience, the way we interpret² those situations is significant also. It is not a matter solely of external circumstances acting upon a relatively passive individual to produce one emotion or another. It is, rather, the *total* situation, including the individual himself, and the way in which he evaluates what is going on. This evaluation will be influenced by the individual's background of past habits and experiences as well as by his immediate circumstances and goals. For example, what will excite anger in one person may leave another quite unruffled. A girl of 20 may be insulted if a man whistles at her, but a woman of 40 secretly may feel complimented! When we see a fu-

² E. Duffy, "An Explanation of 'Emotional' Phenomena Without the Use of the Concept 'Emotion,'" *Journal of General Psychology*, 1941, 25:283-293.

neral procession we usually feel no sorrow unless the deceased is a friend or relative and we therefore interpret his death as a loss to us. Furthermore, the same situation may be interpreted as a gain to one and a loss to another. At a wedding, for instance, the bride has gained a husband (presumably a cause for joy!), but her devoted mother may feel sorrow over losing her.

In everyday life we rarely experience one emotion alone, as will be pointed out later. Simple emotional reactions become combined through experience until the pattern of mature emotional response is so complex that its analysis is practically impossible.

We may define emotion, then, as the response which an individual makes when confronted with a situation for which he is unprepared, or which he interprets as a possible source of gain or loss to him. This reaction includes both physiological and psychological factors. Most emotional responses are accompanied by physiological changes which usually make the individual feel disturbed, but which may not be different for different emotions. These changes involve variations in the level of available energy within the organism.³ Their purpose seems to be the reinforcement of the individual's capacity to respond adequately to the emotional situation, and thus to facilitate his adjustment to it. In an emergency, for example, one's energy level is increased so that he is better able to cope with it. On the other hand, if one is extremely depressed, his energy level is lowered, and little or nothing is done to meet the problem. Such changes in energy level, also, may be accompanied by varying degrees of disorganization in one's behavior. Not all people are disorganized under emotion, however, and some persons show disorganization when they are not in an emotional state. The form and intensity of emotions are influenced greatly both by the nature of the circumstances and by the way in which the individual interprets them.

HOW ARE DRIVES RELATED TO EMOTIONS?

In the foregoing chapter we saw that biological and social drives are necessary in learning. The operation of such drives is related closely, also, to emotional experience. It was pointed out that bio-

³ *Ibid*, p. 286. Read also R. W. Leeper, "A Motivational Theory of Emotion to Replace 'Emotion as Disorganized Response,'" *Psychological Review*, 1948, 55:5-21, R. Morey, "Upset in Emotions," *Journal of Social Psychology*, 1940, 12:333-336.

logical drives are common to both man and animals, arise from fundamental organic needs, and produce a state of restlessness or tension until a way is found of satisfying them. Such biogenic drives include:⁴

- A maternal drive (suckling of young)
- A nest-building drive
- Thirst
- Hunger
- Sex
- A general activity drive
- An exploratory drive
- A rest or sleep drive
- A urination and defecation drive
- A play drive
- An esthetic drive

In addition to seeking satisfaction of these fundamental wants, organisms also show certain "aversions" and "sufferances." These have not been investigated experimentally as thoroughly as have drives, but the following⁵ have been suggested as being important for human beings:

- Cold-avoidance
- Heat-avoidance
- Danger-avoidance (fright)
- Obstruction-avoidance (aggression)

In the operation of drives the individual tends to move toward some object or situation which will make their consummation possible, and thus relieve tension. On the contrary, aversions cause the individual to move away from certain objects or situations, or to endure them if they cannot be avoided.

Besides these biogenic drives and aversions, social experience creates other kinds of needs which come to act as powerful motives. The following tentative list of social drives⁶ has been proposed:

⁴ E C Tolman, "Motivation, Learning, and Adjustment," in *Symposium on Recent Advances in Psychology, Proceedings of the American Philosophical Society*, Philadelphia, 1941, 84 543-563, especially p 544

⁵ *Ibid.*, p. 547. Reprinted by courtesy of the American Philosophical Society, 104 South Fifth Street, Philadelphia 6, Penna.

⁶ *Ibid.*, p. 548. Reprinted by courtesy of the American Philosophical Society.

- Gregariousness*: returning to company of others of the group
Loyalty to group: defending other members of the group against attack
Imitateness: copying actions performed by other members of the group
Dominance: dominating another individual
Submission: submitting to another
Competitive acquisition: piling up material for the future—such activity being enhanced by the presence of other individuals
Sharing with and soliciting: giving to another individual or receiving from another individual
Cooperation tendencies: working with another individual for a common goal

These social motives are not to be thought of as entirely unrelated to biogenic or physiological drives. They often provide the opportunities for the expression of these drives in socially approved ways. In the final analysis, it is social approval which exerts the strongest pressure upon the individual. To gain it, he must frequently forego the satisfaction of some other drive, or must find a way to harmonize the two. The varying effects of social pressure upon the expression of individual wants is illustrated clearly both in different cultures and in different classes of the same society. A primitive culture, for example, may have quite different standards for marriage and sex relationships from those found among the more civilized peoples. There are wide variations, also, in the standards of sex behavior among different classes of the same society.

From what has been said about the nature of emotions, it is evident that most, if not all, of our emotional experience arises directly or indirectly from the dynamic action of drives and motives. We noted that the emotion of love accompanies the expression of sex or sex-related drives. The gaining of social approval through achievement generally results in feelings of satisfaction or elation. Not only do drives give rise to emotions, but emotions themselves may serve as drives. Particular objects and situations may become emotionally charged and thus may act as stimuli to behavior. An illustration of an emotionally charged situation is seen in the family. Both drives and emotional attachments operate in its complex interrelationships, stimulating each member to particular types of activity.

In a complex society like ours, it is obviously impossible for one to satisfy *all* of his needs and wants. An individual who followed his biological impulses without restraint would soon come into conflict with the rights of others. To protect these rights, society has estab-

lished customs and mores to regulate the behavior of its individual members. Nevertheless, as living organisms, we continue to be activated by our biogenic needs and consequently are in potential conflict with many social standards. Such conflict cannot but result in the blocking or frustration of some of our basic drives, and, as we have seen, frustration is one of the primary causes of emotion. Frustration, of course, is not limited to the simple, physiological drives. Many individuals encounter thwarting also in their attempts to secure social approval and recognition.

During the past decade increased attention has been given to the importance of frustration,⁷ not only as a cause of emotion, but also as a determinant of behavior in general. Some writers have pointed out that, as would be expected, frustration leads to anger, expressed in varying degrees of aggressive behavior. Such aggression may be either overt or subtle, depending upon the circumstances. On the other hand, frustration may produce withdrawal or sufferance, so that the individual either attempts to escape from the situation or resigns himself to it. Sometimes substitute responses like daydreaming or making excuses are used, which temporarily relieve the frustration but do nothing to solve the underlying problem. The role of these artificial mechanisms in adjustment will be considered further in our treatment of personality development.

Other writers have shown that frustration does not always lead to aggression, withdrawal, or sufferance. If the individual is motivated strongly enough to seek the attainment of certain goals,⁸ he will feel neither frustrated nor overwhelmed by any obstacles confronting him but will persevere in spite of them. We shall have more to say about frustration later in this chapter.

In our discussion of emotion, then, we must bear in mind constantly that the functioning of drives and motives can never be separated from emotional behavior. In the long run, the achievement of emotional maturity is dependent, mostly, upon the understanding and control of our drives and motives and their direction into satisfying and socially approved channels.⁹ In other words, emotional ad-

⁷ J. Dollard, L. W. Doob, N. E. Miller, O. H. Mowrer, and R. R. Sears, *Frustration and Aggression*; also Sears, "Personality and Motivation," *Review of Educational Research*, 1944, 14:368-380.

⁸ G. W. Allport, "The Ego in Contemporary Psychology," *Psychological Review*, 1943, 50:451-478, especially pp. 470-471.

⁹ D. A. Prescott, *Emotion and the Educative Process* (American Council on Education, Washington, D.C., 1938).

justment lies not in the suppression of one's drives but rather in finding ways of satisfying them in a socially approved manner.

HOW EMOTIONS DEVELOP

The older psychologists believed that a wide variety of emotional experiences was inherited, and could be studied only through introspection, of which an infant naturally was incapable. Around 1920 Dr. John B. Watson,¹⁰ who was experimenting upon babies at the Johns Hopkins University Hospital, popularized the idea among both laymen and psychologists that the child was born with only three distinct emotions: *fear*, *anger*, and *love*. He maintained, also, that each of these emotions exhibited distinct patterns which could be identified clearly, and that they were provoked by specific stimuli or situations. For instance, the fear response was called forth by loud noises, loss of support, or by the unfamiliar. Stimuli for anger took the form of various kinds of physical thwarting, while love or sex was evoked by patting and stroking the child, especially on the erogenous parts of the body.

Later, some of Watson's ideas about the development of emotional experience were discredited.¹¹ In conducting experiments similar to his, it was shown that the observers were influenced unduly by a knowledge of the stimulating conditions.¹² In one investigation¹³ motion pictures were taken of the reactions of babies who had been subjected to the various types of stimuli which Watson claimed called forth specific emotional patterns. When these pictures were exhibited to adults who did not know the stimulus causing each reaction, they had great difficulty in identifying the emotion which each baby was supposed to be experiencing. Thus, the reaction to being dropped through space was called fear by some, anger or hunger by others. Responses to hunger and pain, also, were confused with anger and fear. However, when informed as to the nature of the stimuli, the adults were much more successful in identifying the in-

¹⁰ Watson, "Recent Experiments on How We Lose and Change Our Emotional Equipment," in C. Murchison (ed.), *Psychologies of 1925* (Clark University Press, Worcester, Mass., 1926), chap. 3.

¹¹ M. Sherman and I. C. Sherman, *The Process of Human Behavior*, (W. W. Norton and Company, Inc., New York, 1929), chap. 6; O. C. Irwin, "Infant Responses to Vertical Movements," *Child Development*, 1932, 3:167-169; K. C. Pratt, A. K. Nelson, and K. Sun, *The Behavior of the Newborn Infant* (Ohio State University Press, Columbus, 1930).

¹² Sherman and Sherman, *op. cit.*, p. 141.

¹³ *Ibid.*

infants' emotional responses in accordance with the conventional classification. In another study¹⁴ the observers, including experienced child nurses, were seated behind a screen and were asked to identify the emotion being experienced by babies through listening to their cries. Again the babies were subjected to stimuli supposed to provoke fear, rage, hunger, and pain, and again the judges found it difficult to identify these emotions unless they knew what stimuli were producing them. It is possible, however, that the mothers of these infants might have been able to identify correctly the emotional significance of their cries. Some psychologists believe that this can be done, but it has not been confirmed by extensive experimentation. As mentioned in Chapter 3, it is probable, also, that Watson confused the startle pattern or Moro reflex observed in infants with the emotional response of fear.

Further experiments¹⁵ have indicated that specific and recognizable emotional patterns are not present at birth but evolve from a general state of excitement. The newborn is activated primarily by physiological needs. When these needs are not met, an unpleasant or disturbed condition results, which the infant makes known by restlessness and crying. When his wants are satisfied, a pleasant state of well-being ensues evidenced by cooing, gurgling, etc., or by sleep. The baby tends to move toward or approach the objects, persons, or situations which satisfy his wants, or to avoid or withdraw from things which cause or are associated with discomfort. This generalized excitement, including pleasantness and unpleasantness, approach and withdrawal, constitutes the infant's emotional repertoire for about the first three months of life, when his behavior is on a purely vegetative level. Through a combination of maturation and learning these diffused responses become differentiated into more specific emotional patterns, depending upon the amount of handling the child receives and the degree of stimulation present in his environment.

One investigator has outlined the course of emotional development from birth to two years of age.¹⁶ (See Fig. 59.) It will be noted

¹⁴ M. Sherman, "The Differentiation of Emotional Responses in Infants," *Journal of Comparative Psychology*, 1927, 7:265-284.

¹⁵ J. H. Taylor, "Innate Emotional Responses in Infants," in F. C. Docketay (ed.), *Studies in Infant Behavior* (Ohio State University Press, Columbus, 1934), pp. 69-81.

¹⁶ K. M. B. Bridges, "Emotional Development in Early Infancy," *Child Development*, 1932, 3.

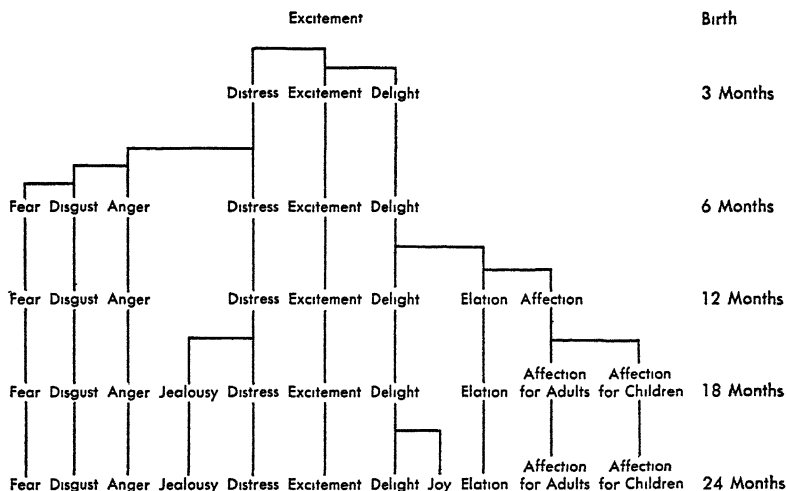


FIG. 59. The Differentiation of Specific Emotional Patterns from a General Condition of Excitement During the First Two Years of Life (after Bridges). By permission of The Society for Research in Child Development

that distress and delight first evolve from a general state of excitement. Distress becomes differentiated into fear, disgust, and anger around six months of age. At one year, elation and affection have developed from delight. At 18 months jealousy appears as a further differentiation of distress, and affection for adults becomes separated from that for children. By the age of two, joy appears as a further evolution of delight.

Watson believed that most complex forms of emotion resulted from the conditioning of the three innate patterns which he postulated. Although simple learning or conditioning does play an important role in the development of specific emotional patterns, it is definitely limited by both the type of the object and the nature of the situation involved. For instance, a pair of shiny black shoes induced fear in a child because she came upon them *suddenly*, although she had shown no previous fear of shoes—in fact, she had enjoyed playing with them.¹⁷ Some objects, too, seem to be more fear-provoking than others. Thus, it appears easy to condition children to fear animals, but it is difficult to induce fear of inanimate objects—blocks, opera glasses, curtains, and the like.

We may conclude, therefore, that existing evidence fails to sub-

¹⁷ H. B. English, "Three Cases of the Conditioned Fear Response," *Journal of Abnormal and Social Psychology*, 1929, 24:221-225.

stantiate Watson's contention that distinct emotional patterns, such as fear, anger, and love, are present at birth. It does not seem possible either to account for the expansion of emotional experience on the basis of conditioning alone. Patterning does occur, however, with increased maturation and greater complexity of the environment. Throughout childhood the rapid growth of experience and the expansion of social contacts give rise to many complicated emotional situations.¹⁸ This is even more true during adolescence, when the sex drive takes on new meaning, and the pressures of social groups are felt most keenly. We tend, nevertheless, to classify the emotional problems of childhood and youth under the basic headings of fear, anger, and love. It must not be forgotten, however, that not all our emotional experiences can be classified in this way. The positive emotions, like elation and joy, and the appreciation and enjoyment of humor also play a significant part in our daily life. Moreover, many emotions which are thought of as distinct actually are combinations of several different ones. Thus, jealousy involves fear and anger, and frequently love as well. With increasing maturity and experience, emotional behavior becomes so complex that the identification of any particular pattern often is very difficult. This is especially true where the individual has learned to control the outward manifestations of his emotional behavior, or is ingenious in feigning those which he does not feel.

PHYSICAL CHANGES ACCOMPANYING EMOTION¹⁹

In order to understand the physical changes which accompany emotions, it is necessary first to get some idea of the nervous system and its relation to these changes. The human nervous system consists of two main divisions: (1) the central or cerebrospinal, comprising the brain and spinal cord, and (2) the autonomic, made up of two chains of nerve ganglia or bunches of nerve cells lying on either side of the cord. In addition there is a vast network of nerve fibers, called the peripheral system, connecting the central and autonomic systems and supplying nervous energy to every part of the body (see Fig. 60).

Broadly speaking, the central nervous system provides the indi-

¹⁸ N. Bayley, "The Emotions of Children: Their Development and Modification," *Childhood Education*, 1944, 21:156-160.

¹⁹ W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage*; Ruckmick, *op. cit.*, chap. 10.

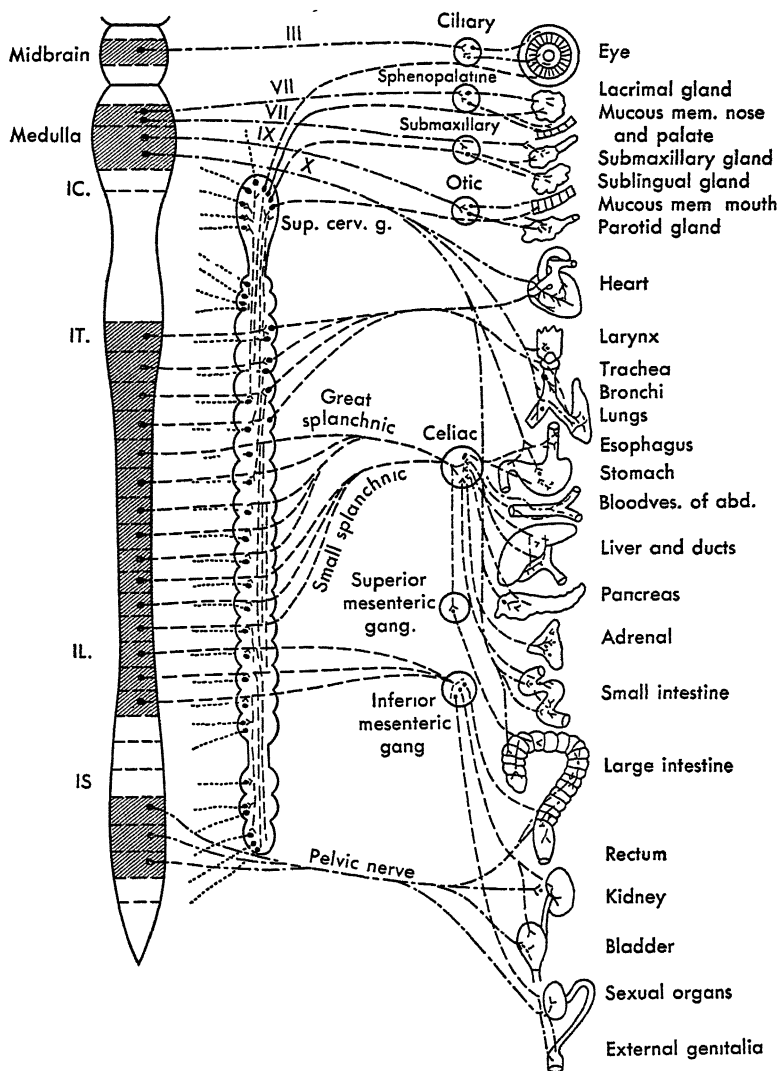


FIG 60 Schematic Drawing of the Autonomic Nervous System and Its Relationships to the Central Nervous System and the Vital Organs (modified after Meyer and Gottlieb). (From H Gray, *Anatomy of the Human Body*, Twenty-Fifth Edition, 1948, p. 1000. By courtesy of Lea and Febiger, publishers, Philadelphia)

vidual with facilities for immediate response and adjustment to various kinds of stimuli. It provides for a wide variety of responses from simple reflexes to voluntary behavior and thinking, which involve the higher brain centers. The autonomic nervous system, as its name implies, functions semi-independently of the central system. It is, nevertheless, partially under the control of the brain and is affected, also, by sensations picked up by that system's receiving mechanisms—the sense organs. The primary function of the autonomic nervous system, however, is to supply the required nervous energy for the so-called “vital processes,” such as respiration, digestion, elimination, etc. Ordinarily these processes go on continuously and are under voluntary control only to a limited extent. As we shall see presently, it is the changes in the autonomic system that are chiefly responsible for the physical alterations which go with emotion. We must, therefore, consider its structure and function in somewhat more detail.

The autonomic nervous system is divided into three parts: (1) the cranial division, occupying the position extending roughly from the region of the medulla to a point between the shoulders; (2) the sacral division, occupying the area around the base of the spine; and (3) the sympathetic division, often called the thoracolumbar, which lies between the upper and lower sections. The cranial and sacral divisions together are often referred to as the parasympathetic division. Nerve fibers from the cranial division go to the respiratory system and the upper part of the digestive tract. Many physiologists believe that their function is to hold down the heartbeat and respiration to a normal rate, and generally to conserve bodily energy. Nerves from the sacral division activate the lower part of the digestive tract, the eliminative processes, and the sex organs. Nerves from the middle or sympathetic division also are connected with the areas just mentioned and, in addition, with the adrenal glands and other widely distributed parts of the body. Their general effect seems to be to intensify reactions, such as speeding up the heart, contracting blood vessels, eliminative mechanisms, etc.

One of the most widely accepted explanations of the physiological changes accompanying emotion was the so-called emergency theory advanced by the late Professor Walter Cannon. He believed that the sympathetic and parasympathetic divisions of the autonomic nervous system were antagonistic in their functions, and that when one was dominant the other was suppressed. Under ordinary conditions the

parasympathetic division operates to promote normal respiration, digestion, elimination, and other semivoluntary functions, and the sympathetic division is held in check. Now let us suppose that the individual encounters an emergency situation for which he has no ready response, so that emotion ensues. The balance of power in the autonomic nervous system is changed. The sympathetic division becomes dominant and inhibits the activity of the other division. The respiration rate is increased, digestion is stopped, and there may be temporary loss of control over the eliminative functions. In addition, the adrenal glands are stimulated to pour larger amounts of their secretions into the blood stream. This, in turn, has the effect of stimulating the heart, releasing larger amounts of energy-producing sugar from the liver, and toning up the voluntary muscles to their highest point of efficiency.

Cannon believed that the general purpose of these physical changes was to increase the individual's ability to cope with an emergency. This would account for the unusual feats of strength often performed by persons under emotional stress, as, for instance, in carrying a heavy object or another person out of a burning building. An instance of this was cited in Chapter 4 in connection with our discussion of endocrine glands. It would explain, too, the marked increase in resistance to fatigue during strong emotion, so that the individual is frequently able to work harder for a longer period of time than would usually be the case.

Cannon's emergency theory has been subjected to considerable criticism within recent years.²⁰ It is believed now that the divisions of the autonomic nervous system do not function necessarily in opposition to one another, but that the whole system²¹ is involved in producing the physical changes which arise during emotion. One investigator suggests that fear is associated with activity of the sympathetic division, anger with strong parasympathetic activity, and excitement with moderate parasympathetic function.

The role which Cannon assigned to adrenin in the physiological changes accompanying emotion also has been questioned. Although

²⁰ M. B. Arnold, "Physiological Differentiation of Emotional States," *Psychological Review*, 1945, 52:35-48, also J. M. Rogoff, "A Critique on the Theory of Emergency Function of the Adrenal Glands: Implications for Psychology," *Journal of General Psychology*, 1945, 32:249-268

²¹ W. A. Hunt, "Recent Developments in the Field of Emotion," *Psychological Bulletin*, 1941, 38:249-276, especially p. 253.

the adrenal glands increase their activity during strong emotion, it seems to be the secretion from the outer layer or cortex, known as cortin,²² which increases bodily energy. Adrenin, the secretion from the core or medulla of the adrenals, which was formerly thought to increase muscular strength, has been shown to be a depressant, actually reducing it. It has been said, also, that glandular activity in itself cannot bring about such profound bodily changes as those which occur during emotion. Instead, these probably are induced by shifts in the output of nervous energy in the autonomic system.

Because of these findings, the theory that emotion can be explained solely as the body's automatic efforts to meet an emergency seems no longer tenable. Anger and excitement do increase an individual's ability to cope with an unforeseen situation by raising his energy level. Fear, however, is depressing, and if one reacted naturally to it, he would do nothing. The value of fear, therefore, is not that it enables us to meet the feared event better but that it promotes caution, keeping us away from dangerous situations.

It is probable, also, that the emergency theory of emotion laid too much stress upon the functioning of the autonomic nervous system. Other nerve centers too are involved in emotional behavior, particularly the hypothalamus²³ in the midbrain. Neural discharge from this area seems to be necessary in setting off emotional reactions. The autonomic system appears to act as a relay, picking up the nervous energy from the hypothalamus and intensifying and diffusing its effect.

There is still much that we do not understand about the physical changes which accompany emotions. We do know, however, that they are an important part of our emotional experience and constitute one of the major aspects of the problem of emotional control. For example, the regulating power of the higher brain centers is necessary to direct the additional energy released by emotions into appropriate channels. If, for example, anger is so intense that all control is blocked, the individual may expend his energy in useless activity, such as stamping, or breaking objects, which has no relationship to the source of the anger. As we shall see, such "tantrums" occur frequently among small children because they are still immature. The persistence of this behavior in adults, however, indicates failure to develop adequate habits of control. The enervating effects

²² Arnold, *op cit*

²³ Hunt, *op cit*

of fear and worry can be counteracted, also, by the individual's ability to recognize worth-while goals and to work for them despite temporary setbacks and discouragements. Changes in the autonomic nervous system account, too, for the digestive upsets so frequently associated with emotion and for the loss of bladder or bowel control for which children often are punished unjustly. It should be noted that some of the physical changes we have described are intended to assist the individual in dealing with the emotion-provoking situation in an *overt* manner, that is, by doing something about it. Modern society generally makes such direct, overt responses impossible. There is often no way for the individual to "work off" his added energy, and its suppression causes its effects to be unusually prolonged. For instance, anger denied an opportunity for overt response tends to feed upon itself and keeps the individual in a constant state of turmoil. Even after the emotion itself has passed, the physical changes may persist for some time as "hang-overs" in which the unpleasant effects of the emotional experience are still felt.

From the physical standpoint, then, it would seem that the best general ways of dealing with strong emotion are: (1) reinterpreting the emotion-provoking situation in terms of broader goals; (2) finding a socially acceptable outlet through which additional energy may be discharged; and (3) developing adequate habits of control to guide such energy into these appropriate outlets. Again, we must remember that ability to direct emotion increases with maturity; we cannot expect the same degree of control from young children as from adults. Taking the above factors into consideration, we should be able to see clearly the futility of a policy of suppression and punishment in dealing with the emotional responses of children and youth.

Furthermore, even if it were possible to eliminate emotional responses, it would hardly be desirable to do so. They are of distinct service in enabling man to protect himself from danger, and, when properly directed, the energy which they liberate may result in constructive achievement. Emotional experience adds color and zest to living and is essential to all forms of aesthetic appreciation.

HOW WE STUDY EMOTIONS²⁴

We have already referred to the difficulty of studying the subjective aspect of emotion because of the unreliability of introspection

²⁴ Ruckmick, *op. cit.*, chaps. 9-12.

and the impossibility of using it with infants and young children. Methods have been devised, however, for the observation, measurement, and recording of certain of the physiological and behavior changes which are an integral part of emotional reactions.

As was noted in the foregoing section, emotional response includes a quickening of the heartbeat and a consequent increase in the breathing rate. The constriction of blood vessels resulting from increased activity of the sympathetic division of the autonomic nervous system during emotion also brings about a distinct rise in blood pressure. The observation and measurement of these two phenomena, therefore, will indicate with some accuracy whether an individual is experiencing an emotion, and how intense the emotion is. It will not show what *specific* emotion is being felt. Both the above-mentioned changes are largely beyond voluntary control. Nevertheless, as can readily be seen, blood pressure would be less likely to be influenced by this factor than would respiration. In general, therefore, the former is considered to be a somewhat more reliable index of emotional response than is the latter.

A practical application of these principles is the Keeler polygraph, popularly known as the "lie detector," shown in Figure 61. It should be emphasized that the "lie detector" measures and records the physiological variations resulting from emotional response and does not actually detect lies, as is sometimes believed. Although many persons are able to lie without showing any observable physical changes, few, if any, can do so without some emotional reaction. Such reactions, as we have seen, induce changes in breathing and blood pressure, and the polygraph detects and makes graphic records of both of them on a slowly moving strip of paper as shown in the illustration (Fig. 61). When the individual being questioned gives truthful answers no emotional change is recorded, but if he lies, an immediate alteration in the graphic records of his breathing and blood pressure usually can be observed. Although the "lie detector" has been criticized as subject to serious errors,²⁵ it has proved to be of great assistance to law-enforcement agencies, even though its results are not generally admitted as direct evidence.²⁶

Another method of detecting emotional reaction is the measure-

²⁵ W. S. Stewart, "How to Beat the Lie Detector," *Esquire*, November, 1941, pp. 35, 158, 160.

²⁶ F. E. Inbau, *Lie Detection and Criminal Interrogation*, pp. 60-70.



FIG. 61. The Keeler Polygraph. (By courtesy of Sergeant C. R. Cobb, Criminal Identification Bureau, West Virginia Department of Public Safety, and the *Charleston Gazette*.)

ment of changes in the electrical resistance of the skin, known as the psychogalvanic reflex, or preferably as the electrodermal response²⁷ Nerve fibers from the sympathetic division of the autonomic system are connected with the sweat glands; hence, in strong fear and anger profuse sweating occurs. Even in mild emotional reactions there is a slight increase in moisture on the surface of the skin. This additional moisture lowers its resistance to the passage of an electric current, and such variations can be gauged by a finely adjusted galvanometer, an instrument designed to measure the flow of electric current. Since skin moisture is obviously influenced by other factors, such as temperature, air humidity, etc., these must be held constant if the psychogalvanic reflex is to be accurate in measuring emotion. Other environmental conditions, such as noise, have also been shown to influence the electrodermal response. This method, therefore, requires considerable care in its use as a measure of emotion.

The instrument employed to measure the electrodermal response

²⁷ Ruckmick, *op. cit.*, chap. 11.



FIG. 62. An Indicating Type Galvanometer. (From the Morris Harvey College Psychological Laboratory. Apparatus photographed by permission of Lafayette Instrument Company, 26 N. 26th Street, Lafayette, Ind.)

is usually called a psychogalvanometer, two types of which are available. In one, known as the indicating type, the changes in skin resistance are amplified and recorded on a dial. In the other type, these changes are amplified and recorded graphically by means of additional apparatus upon a strip of paper. Figure 62 shows an indicating type galvanometer with electrodes connected to a subject's forearm.

In some recent models of the Keeler polygraph, a recording type galvanometer is included, in addition to the apparatus for measuring respiration and blood pressure. In this way, recordings of fluctuations in electrical skin resistance, changes in blood pressure, and variations in breathing rate are made simultaneously. Such multiple records are valuable because they permit comparison of different types of physiological changes. It is felt that if an individual shows simultaneous deviations from his normal record on these three phases of physiological function, he is almost certainly giving a false answer to the question being asked. If, on the other hand, he shows variation in only one of these phases, it may indicate either the operation of

some extraneous factor or of his efforts to "beat" the "lie detector."

Some attempt²⁸ has been made to apply measurements of pulse rate and blood pressure to infants and young children. In general, however, such efforts have yielded unsatisfactory results because of the necessity for the understanding of these techniques by the subject, and for his voluntary cooperation. Galvanometric methods have been applied successfully to babies and preschool children,²⁹ but lack of standardization gave so wide a variety of results that their reliability seems doubtful. Until these objective methods are perfected, therefore, the observation of overt behavior patterns seems to be the only way of studying the emotional reactions of young children—and, as we have seen, it is subject to considerable error.

The association test³⁰ is a method which often gives practical aid in solving children's behavior problems and in dealing with adults who may be psychopathic or demented.³¹ Its value with bright individuals may be limited, however, because they may "play up" to the investigator. The examiner confronts the subject with a list of ordinary words mixed up with some emotionally toned words related to the situation being studied, and asks him to respond with the first one that occurs to him. If the individual gives many delayed or unusual responses to the emotionally toned words, the examiner may be able to ascertain some relationship between this behavior and the individual's emotional adjustment. This technique is not always successful, but it is often helpful in abnormal or problem cases.

The following incident from the writers' experience illustrates the use of the word association technique. In a residential school several phonograph records belonging to an 11-year-old boy had been smashed, and no one seemed to know how it happened. Instead of questioning all the boys living in the cottage where the incident occurred, three were selected who it was believed might have been implicated in the breakage. Each of these three was given individually an association test in which words connected with the episode were

²⁸ M. C. Jones and B. S. Burks, *Personality Development in Childhood*, Society for Research in Child Development, National Research Council, Washington, D C, Monograph, 1936, 1-8, 65.

²⁹ *Ibid.*, pp. 8, 64-65

³⁰ F. Mateer, *The Unstable Child* (Appleton-Century-Crofts, Inc., New York, 1924), pp. 97-99.

³¹ The well-known standardization by Kent and Rosanoff is usually given.

interspersed with ordinary words. One of the boys became quite excited when given the word "records," and replied, "broke." When asked directly if he had smashed the records, he readily admitted that he had.

After World War I a questionnaire which had been devised to ascertain neurotic tendencies in soldiers was adapted to civilian use for both children and adults.³² The purpose of these so-called psychoneurotic inventories is to show how well the individual can adapt himself satisfactorily to unfamiliar and trying circumstances. The score is based upon one's reactions to fears, worries, sex, anger-provoking situations, self-feelings, jealousies, family relationships, compulsions, obsessions, and physical symptoms. Although a number of adjustment inventories have stemmed from this questionnaire, their value is somewhat doubtful. This is especially true with bright children and adults who often "see through" the purpose of the questions. The Mathews Revision was the first adaptation for children 12 and 13 years of age; the Personality Schedule, by the Thurstones, and the Bernreuter Personality Inventory are among the better-known ones for college students and adults. A few typical items are as follows:

1. Do you ever have the feeling that someone is following you?
2. Do you like your father better than your mother?
3. Do you ever walk in your sleep?
4. Do you become angry easily?
5. Do you have headaches frequently?
6. Are you afraid of the dark?

The Pressey Interest-Attitude Test is quite similar in nature and often is helpful. Here the subject is asked to cross out words which he considers wrong morally, words which worry him, and words in which he is interested. In this way sources of emotional upset may be disclosed.

In general it may be concluded that while all the methods we have considered are helpful in the study of emotion, no *single* approach is entirely satisfactory, and all are subject to considerable error.

³² For a good summary of this questionnaire and its derivatives read P. Symonds, *Diagnosing Personality and Conduct* (Appleton-Century-Crofts, Inc., New York, 1931).

EMOTIONAL PROBLEMS OF CHILDREN AND ADOLESCENTS

It will be recalled that early infancy is characterized by generalized states of pleasantness and unpleasantness, and that these later become differentiated into specific emotional patterns which adults call fear, anger, and love from the type of overt adjustment which is made. Shrinking behavior is called fear, whereas direct attack is associated with anger, and approach is connected with love or sex. It has been indicated, also, that certain classes of stimuli usually call forth certain specific emotional reactions, but that these in themselves may not evoke the expected response. In the final analysis, the question of whether fear, anger, love, or any other emotion will be elicited depends both upon the surrounding circumstances and upon the way in which they are interpreted. The number of an individual's emotional experiences will depend upon his maturity, and the kind of environment in which he lives. In this section we shall discuss the nature of fears and worries, anger, jealousy, and reactions to frustration, emotions associated with sex in children and youth; and methods of controlling them.

FEARS AND WORRIES

Of all the emotional experiences, fears and worries are of the least value, for, as we shall see, many of them are imaginary and exceed the difficulties which actually exist in life. Furthermore, fear leads to the blocking of behavior; hence the individual does nothing to relieve his tension, or else meets the situation by running away from it or by surrender. If a child is often frightened, he may eventually become chronically afraid and unable to make normal social adjustments. A certain amount of fear, however, is necessary for protection from dangerous situations. The problem confronting the parent or teacher, then, is to prevent the rise of unnecessary fears and to control those which have already become established. To deal intelligently with such problems a knowledge of the kinds of things which children and adolescents fear, and their motives for fearing them, is vital.

Generally speaking, an individual who is in poor health or fatigued is more susceptible to fears than is one who is robust and

rested. Extensive investigations³³ show that the things which children fear increase with age, and that the character of the objects or events feared changes. There appears to be some relationship between number and types of fears and socioeconomic status. Children from better homes exhibit more fears, especially fears connected with personal safety, such as accidents, illness, and the like, than do those from poorer homes, who are afraid of the supernatural and of things remote from their experiences.

Fears may also be instilled in the child in a home where the wage earner is unemployed, or in a family broken by death or divorce. It has been shown, too, that a close relationship exists between the fears of the mother and those of the child. We may expect children to exhibit more fears, therefore, if the mother is apprehensive or worried over many things. As the child grows older his fears increase, so that he not only is afraid of the things that actually happen but also "crosses many more bridges" than he really meets.

Dr. Jersild found that about 90 percent of all fears observed during the first year of life are evoked by "noises, strange events, sudden, rapid, or unexpected movement, painful shocks, and events associated with pain and falling or danger of falling."³⁴ Most of the fears characteristic of young children can be traced back to certain concrete stimuli in their environment, as, for example, the fear of a false face, of the rattling of a window, of an animal or stranger appearing unexpectedly, or of the sudden stopping of an elevator.

Between two and five years of age there is a marked increase in fears, especially of an imaginary nature, such as ghosts, robbers, kidnapers, skeletons, and the supernatural. Fear of animals ranks next in frequency, followed by the fear of people and events strange or remote from the child's experiences; also of darkness and being alone. Less than 10 percent of the fears were concerned with physical injury, as those associated with accidents, burning, drowning, and dying.

Things which threaten a child's status or security may be sources for fear beyond the age of five, and may include "fear of failure, ridi-

³³ A. T. Jersild, "Research in the Development of Children," *Teachers College Record*, 1936, 38:129-143; A. T. Jersild and F. B. Holmes, *Children's Fears*; Jersild, "Emotional Development," in L. Carmichael (ed.), *Manual of Child Psychology* (John Wiley and Sons, Inc., New York, 1946), chap. 15.

³⁴ Jersild, "Research in the Development of Children," *Teachers College Record*, 1936, 38:130.

cule, and loss of prestige." He becomes more aware of the pressure exerted by his family and social group to make him conform to certain patterns of behavior. He knows that punishment of some sort will be forthcoming if he does not follow these standards.³⁵ The punishment may be physical, but it involves, also, loss of the approval of parents, teachers, and other adults, and the ridicule of other children. Not only do fears and anxieties result from these social pressures, but the child is afraid to show them because he does not want to be called a "fraidy cat," "coward," or "sissy" by his peers.

In an inventory of the worries of 540 children in grades 5 and 6 in New York City,³⁶ it was found that family items and the possibility of school failure troubled them most. The investigators felt that worries about the home might not be reduced so easily as those about school matters, and suggested that less emphasis be placed upon "failing a test," "having a poor report card," "being late to school," and "being left back in school."³⁷ Worry over school work provides an interesting illustration of the tendency to "cross bridges" before they are met, which was mentioned above. Although a large proportion of school children worry about nonpromotion, records show that only about 1 percent fail!³⁸

Most of the available information on children's fears has been obtained from urban groups. A recent study was made, however, to find out about the fears of rural children.³⁹ In this study, Pratt asked 570 boys and girls from 4 to around 16 years of age to write down all the things they were afraid of. It was found that the girls listed more fears than did the boys, and that the children enrolled in grades 5 through 8 had a greater variety of fears than had those from kindergarten through grade 4. Of the 4292 fears listed, 75 percent were of animals, especially wild beasts, such as bears, lions, and tigers. Children in the four upper grades showed a greater incidence of fears connected with illness and disease. They also exhibited more fears

³⁵ A Davis in N B Henry (ed), *Adolescence The Forty-Third Yearbook of the National Society for the Study of Education* (Department of Education, University of Chicago, Chicago, 1944, Office of the Secretary, 5835 Kimbark Avenue, Chicago, Ill.), chap. 11, pp. 207-211.

³⁶ R. Pintner and J Lev, "Worries of School Children," *Journal of Genetic Psychology*, 1940, 56, 67-76

³⁷ *Ibid.*, p. 75.

³⁸ Jersild, in Carmichael (ed), *op cit*, p 764.

³⁹ K. C Pratt, "A Study of the 'Fears' of Rural Children," *Journal of Genetic Psychology*, 1945, 67, 179-194.

about their school subjects and whether or not they would pass than did the younger children. It is interesting to note that in general the boys showed more fears concerning their school work and the supernatural than did the girls.

Strangely enough, the rural children expressed greater fear of animals than did the city children. The investigator thinks this may be explained by the fact that the children have heard stories about the dangers of wild animals as part of the cultural background of the region in which they live.⁴⁰ Although they probably will never come into contact with these animals, they have a greater fear of them than of those in their immediate environment!

As compared with rural children, city children show more fears about the occult, the supernatural, death, and dead people.

Although these results are at variance, to some extent, with those found for city children, Pratt points out that this may be accounted for, in part, by differences in the technique employed. For example, in some studies children were observed in experimental fear situations, whereas in others writing out lists of fears or checking worry inventories was employed. In evaluating results, also, some investigators used classes of fears and counted *all* fears occurring in any one category only once, no matter how often or how differently they were expressed.⁴¹ In others, like Pratt's, the total number of fears listed was used in compiling the results. It must be remembered, too, that when children are asked to write down all their fears some of those listed may represent only verbalizations, and may exceed what the child actually experiences.

Children of the present generation seem to be exposed to many more hazards and fear-provoking situations than existed in former years. The dangers of traffic, and the radio, comic, and movie "thrillers" are almost universally present in the experience of the modern child. Nevertheless, there is no apparent increase in the fears of today's children as compared with those of a generation ago.

Even the war conditions to which many children were subjected for several years do not seem to have produced as many or as serious cases of exaggerated fear as might be expected.⁴² English children

⁴⁰ *Ibid.*, p. 192.

⁴¹ *Ibid.*, p. 191.

⁴² A. T. Jersild and M. F. Meigs, "Children and War," *Psychological Bulletin*, 1943, 40:541-573, especially p. 567, and J. L. Despert, *Preliminary Report on Children's Reactions to the War* (Including a Critical Survey of the Literature)

who lived under almost constant air raids eventually became negatively adapted to them, or remained calm if their parents were undisturbed. In some cases they were less affected by bombing than were the adults. An interesting instance of a boy's becoming so engrossed in a book that he was oblivious to everything around him is cited by Anna Freud.⁴³ A youngster who was absorbed in his reading was interrupted by his excited mother, who told him "to drop his book and attend to the air raid!" The incident is also related⁴⁴ of a girl of eight whose home had just been demolished and who came running to her teacher, saying: "Oh, Miss, you should have seen when he came out; he was black all over." Children were drilled so often in donning gas masks and doing shelter drills that they did not always know whether the raids were real or not. The small ones usually had so much fun playing games that in one case when the all-clear came, they begged: "Please, teacher, may we go on with the air raid?"⁴⁵

A study⁴⁶ was made of 44 children who were patients in a hospital when it was bombed, and who had been evacuated during the height of the raid. Sixty-one percent showed such signs of strain as night terrors, enuresis, soiling, nervousness, crying, and the like, anywhere from three weeks to two months after the raid. Even after seven months 11 percent of the children between one and five and a half years showed persistent symptoms of strain. Children who were old enough to talk would not say anything at first about their experience, but later dramatized it in their play. Those around seven and a half years or more, however, accepted the air raid as an adventure.

English preschool children often were more afraid of being separated from their mothers than they were of the noise and danger of bombing.⁴⁷ It was not the separation itself which was the cause of

(distributed by the author, The New York Hospital, 525 E. 68th Street, New York, N.Y.)

⁴³ A. Freud and D. T. Burlingham, "Five Types of Air Raid Anxiety," May, 1942, 5 pp. (distributed by Foster Parents' Plan for War Children, Inc., 55 W. 42nd St., New York, N.Y.).

⁴⁴ "The Schools in Wartime" (issued by the Ministry of Information on Behalf of the Board of Education, British Information Services, 1941, 26 pp.).

⁴⁵ *Ibid.*

⁴⁶ F. Bodman, "War Conditions and the Mental Health of the Child," *British Medical Journal*, 1941, Part II, pp. 486-488.

⁴⁷ A. W. M. Wolf, *Our Children Face War* (Houghton Mifflin Company, Boston, 1942); E. Blue, "Children in War Time," *Nation*, 1942, 154 545-546.

such fear, but rather the suddenness with which all that the child knew and loved disappeared. Even the small child wonders why his mother is not with him and especially why she remains in a place where there is danger.⁴⁸

We do not know, of course, what the long-range effects of children's war experiences will be, or the extent to which these will be influenced by other factors, such as malnutrition, overcrowding, and placement in foster homes.

With the coming of adolescence there is a change in both the number and the nature of fears and worries. Although some childhood fears persist even into adulthood, broadening experience brings a general reduction in the objects and situations feared. There is, however, an increase in vague fears and worries, many of which are associated with the physiological changes accompanying puberty. For instance, a boy whose voice is changing may refuse to recite in school because he fears the ridicule of the other students or the sarcasm of the teacher. As we saw in Chapter 4, fears associated with maturing sex functions or with physical blemishes which make the individual feel inferior are also quite common at this time.

Increased sensitivity to social pressure and the desire to be attractive to the opposite sex are prolific sources of fear and worry during adolescence and youth. To be rejected by one's peers is perhaps one of the greatest catastrophes which can befall an adolescent. Equally serious is the plight of the individual who is unable to "get a date." During these years, also, differences in social class come to be felt more keenly.⁴⁹ The lower-class child may not be aware, to any great extent, of the difference between his status and that of boys and girls of the middle class. After adolescence, however, such differences are accentuated greatly, and make the lower-class individual feel inferior and insecure. An analogous situation exists between those of the middle and upper classes.

In addition to the persistence of fears and worries concerning school achievement, the adolescent begins to be disturbed, also, about selecting a vocation and making a living. This was particularly evident during the economic depression of the thirties, when many

⁴⁸ Freud and Burlingham, *Report on Hampstead Nurseries* for April and June, 1942; J. C. Kenna, *Educational and Psychological Problems of Evacuation, An Analysis of Experience in England* (Australia Council for Educational Research, February, 1942, 47 pp.).

⁴⁹ Davis, *op. cit.*, pp. 207-211.

young people felt that there was no place for them in adult society, and that there was no opportunity for them to become financially independent.⁵⁰ Although this source of worry may not be so evident in times of prosperity, it constitutes, nevertheless, a genuine problem for most high school and college students. Conflicts over religious beliefs may also be a source of worry and insecurity, as we shall see in a later chapter.

That the fears and worries common to adolescents are characteristic also of college students is revealed in a study conducted at the University of Sydney, Australia.⁵¹ One hundred subjects, approximately equally divided between the sexes, were given a worry inventory. They ranged in age from 17 to 47 years with an average age of 20.4. The subjects were asked first to check items which had ever caused them to worry and were then requested to put a ring around the number of each one which still disturbed them. Feelings of inferiority and sex difficulties were most prominent as causes of worry, but there was a decline in the number of situations listed as present sources of worry, as compared with those indicated as causes of distress at some time in the individual's life. Examples of past and present worries are given on page 346.⁵²

To deal constructively with the problems of fear and worry, we must understand the nature of the situation in which they arise. We must know, also, about the individual concerned and his relationship to his environment. We shall discuss first some techniques commonly used in controlling children's fears, and then offer some suggestions for dealing with the fears and worries of youth.

It should be reiterated that the success of any method or methods of controlling fear in children depends upon the type of situation involved, the child, and the adult employing them. Experimental results indicate that diverting a child's attention from the object or event feared is only of temporary value.⁵³ Consider, for example, the mother who gives her small son an interesting toy in order to divert him from watching a circus clown whose grotesque appearance

⁵⁰ H. M. Bell, *Youth Tell Their Story* (American Council on Education, Washington, D.C., 1938), chap. 4.

⁵¹ A. H. Martin, "A Worry Inventory," *Journal of Applied Psychology*, 1945, 29:68-74.

⁵² *Ibid.*, pp 70-71.

⁵³ J. J. B. Morgan, *Child Psychology* (Rinehart and Company, Inc., New York, 3rd ed., 1942), pp. 199-200.

| | Percentage of Past Worries | Percentage of Present Worries |
|--|-------------------------------|----------------------------------|
| Being nervous or shy | 15 | 18 |
| Entertaining folk | 34 | 15 |
| Being found fault with | 48 | 15 |
| Sexual problems | 31 | 12 |
| Being teased or made a fool of | 39 | 7 |
| Meeting members of the opposite sex | 30 | 6 |
| Being treated unfairly by others | 30 | 5 |
| Leaving tasks unfinished | 29 | 12 |
| Addressing groups or meetings | 38 | 21 |
| Being closely watched or observed | 30 | 12 |
| Feeling self-conscious | 54 | 27 |
| Looking down from a height | 31 | 16 |
| Not being able to converse easily with people | 33 | 13 |
| Blushing | 37 | 16 |
| Lack of self-confidence | 34 | 17 |

frightens him. Some parents feel that certain fears may be "outgrown,"⁵⁴ but investigations have not confirmed this opinion.

Forcing a child to meet a feared situation does not eliminate a fear.⁵⁵ It is not uncommon for parents or well-meaning friends to throw a child who is afraid of the water into a river or pool in order to induce him to swim. Another illustration of well-meaning but futile attempts to eliminate fear through coercion is the case of 12-year-old Virginia. At around the age of four years Virginia developed violent fears of the dark and of being alone, because of the tales of ghosts and "bogie men" told her by a maid. Her mother tried to "cure" this fear by locking Virginia alone in a room for some time. The result of this procedure was to increase the child's terror of being alone, a terror which still persists.

Showing by personal example that there is nothing to fear⁵⁶ may or may not meet with success. Ridiculing a child because he is afraid,

⁵⁴ Watson, *op. cit.*, pp. 60-61.

⁵⁵ D. A. Thom, *Everyday Problems of the Everyday Child* (Appleton-Century-Crofts, Inc., New York, 1928), p. 152.

⁵⁶ *Ibid.*, p. 155.

or trying to talk him out of his fear⁵⁷ by explaining it, as in fears of thunder or lightning, are of doubtful value.

A child who is afraid may be asked to join a group of playmates who accept a feared object,⁵⁸ in the hope that he will be convinced that it is harmless and that his fear may be dissipated. This method may work successfully, but there is also the possibility that it may induce fear in one of the other children through suggestion.

A method employing the association of fear with success or with a pleasant activity seems to be the most effective. This is facilitated, too, when a gradual approach is made to the feared object or event. The following incident illustrates this principle. A three-year-old girl eagerly put out her hands to pat a small Boston bulldog. The dog responded in a friendly fashion and licked her hands. This unexpected behavior frightened the child, and she began to cry. The adult who was supervising the child laughed and said, "Patty [meaning the dog] is trying to kiss you! Watch Patty kiss me!" Thereupon the adult patted the dog and let him lick his hand. The grownup then ignored the baby and played ball with the dog. Gradually the little girl came nearer and wanted to play ball, too, and it was not long until she patted the dog without any evident fear. Sometimes it takes a much longer period to uncondition a child's fear than in the case cited above. For example, in Watson's well-known experiment,⁵⁹ in which a boy was afraid of a rabbit, it took a number of days to overcome the fear. Each day, as the child was eating, the rabbit was introduced into the situation, and was brought a little nearer to the child than on the preceding day. Eventually the fear of the rabbit was overcome and the child even offered it food.

It has been shown, also, that the promotion of certain skills may sometimes aid in preventing and overcoming fears. An example of this is the case of G., an eight-year-old boy, who is developing a fear of other boys who attack him on his way to and from school. G.'s father is attempting to solve this problem by having his son take boxing lessons so that he can defend himself adequately and meet the feared situation successfully.

Fear as a means of securing obedience is frequently used by par-

⁵⁷ Watson, *op cit*, p. 61, and Jersild, "Research in the Development of Children," *Teachers College Record*, 1936, 38:134.

⁵⁸ Watson, *op. cit.*, p. 62.

⁵⁹ *Ibid*, pp. 63-65.

ents and teachers, because it usually brings immediate results. However, these fears may persist over a long period of time and may interfere with the child's home and school adjustment. For example, using a doctor as a threat in order to get obedience later brought about difficulties when a physician was called in during a child's illness. Likewise, the teacher who threatens a pupil with failure may not only block his activity and prevent him from doing his best work but also develop in him a permanent sense of inferiority and the habit of cheating.

The child should be encouraged both at home and in school to interpret objects and events as natural occurrences to be accepted as a normal part of everyday experience. This is true especially of the school-age child, whose increasing knowledge of the world should enable him to distinguish more clearly between natural happenings and things which are potential sources of danger to him.

In times of crisis, such as a war situation, it has been found that the fears of small children are alleviated to some extent by the calmness of the adults around them. Where children are separated from their mothers, it is helpful to place them in small groups under the care of trained adults who act as "mother substitutes."⁶⁰ Community nursery schools and organized play groups were found to be helpful⁶¹ also for children whose mothers worked in war industries.

Obviously, it would be impossible and impracticable to try to prevent or anticipate all types of circumstances which might condition fears in children. However, if parents are aware of the kinds of situations that are likely to cause fear responses, they may prevent many by using a little foresight.

Much of what has been said about controlling fears in children applies also to adolescents and youth. Because of the preponderance of fears and worries connected with social acceptance and economic independence, there are certain techniques which are particularly applicable at this period. More emphasis should be placed upon the development of social skills, so that the teen-ager will feel competent to meet any kind of social situation. More adequate instruction in

⁶⁰ This was used in Anna Freud's nurseries.

⁶¹ R. Updegraff, "The Young Child in Wartime," *National Parent-Teacher*, 1942, 36:40-41, K. W. Taylor, "Educating Parents in Wartime," *Understanding the Child*, 1942, 11:8-13.

physiology and personal hygiene, too, would remove many of the sources of worry connected with sexual maturation.

It is often possible to correct or ameliorate physical defects and blemishes which cause feelings of inferiority and rejection. A 17-year-old girl, for example, had an unsightly scar on her face, about which she was extremely sensitive. She would not mingle with others of her age and finally refused to attend school. She would go out only at night to do occasional baby sitting. Through the efforts of community organizations, plastic operations were made possible, which largely corrected the blemish, the source of her unhappiness. She is reported to be making progress toward normal socialization, but time will be required to enable her to make a satisfactory adjustment.

More effective educational and vocational guidance and counseling would lessen some of the worries which young people experience about the problem of making a living. Many high school and college students have no accurate information about the multitude of occupations existing at the present time. Functional courses in vocational information, therefore, or institutes in which students can talk with representatives from business, industry, and the professions are extremely helpful. There is need, also, for young people to gain a more realistic appraisal of their abilities and interests before selecting an occupation. The problem of vocational education is a difficult one in our highly specialized industrial society. Many educators feel that some kind of cooperative work-study plan should be put into effect during the high school years so that boys and girls may be trained for a specific job while continuing their education.

The differences in social status which have become attached to various occupations should be deemphasized. All kinds of jobs are equally important in the functioning of our national economy, and youngsters should not be made to feel that a "white-collar" occupation is necessarily superior to manual work. Many girls insist upon entering the teaching profession not because they have the requisite qualifications but rather because they or their parents think it carries greater social prestige than sales, clerical, or factory work. Boys, also, frequently try to enter some occupation or profession for which they are not suited merely because of its prestige value. This social differentiation on the basis of occupations contributes largely to the

class distinctions which are so often responsible for feelings of inferiority and insecurity during adolescence. A program of educational and vocational training minimizing such distinctions would aid greatly in reducing the worries and anxieties of young people.

ANGER, JEALOUSY, AND REACTIONS TO FRUSTRATION

Of all our emotions, anger and annoyance are perhaps the most common. When experienced too frequently and violently, anger has a debilitating effect upon the individual, and its persistent recurrence may interfere seriously with his adjustment. We must not forget, however, that anger sometimes has positive value. Most social reforms have been carried out by people who are spurred on by indignation at existing injustices. Nevertheless, too violent anger interferes with constructive effort, since it causes one to dissipate his energy in fruitless activity. Jealousy of one kind or another, also, is an experience familiar to most of us. If allowed to dominate one's relationships with others, it leads to selfish, infantile, and asocial behavior.

Probably the most extensive and thorough investigation of anger in children was made by Dr. Florence Goodenough of the University of Minnesota.⁶² She studied 1878 anger outbursts in children from seven months to eight years of age over a period of 2184 days. It was found, in general, that anger is induced by situations in which the child's activities or plans are thwarted, or where there is interference with his possessions or prestige. The circumstances which call forth this emotion, and the resultant behavior, are influenced by age, sex, and environmental conditions peculiar to the individual.

The methods of control used by parents, the child's physical condition, and the atmosphere of the home have a considerable influence upon the number and nature of anger outbursts. A definite relationship seems to exist between children's anger and their health, the tendency being for it to increase when they are suffering from colds, constipation, or enuresis (bed-wetting). Results also show a tendency for such outbursts to occur just before meals.⁶³

Anger may result in infants under one year of age when they seek attention and cannot get it without being naughty; when they suffer from some minor discomfort, as being hungry or stuck by a pin;

⁶² F. L. Goodenough, *Anger in Young Children*.

⁶³ *Ibid.*

when they object to daily routine, as in getting dressed, bathed, fed, and like situations; and less frequently when their bodily movements are restricted.

From two years upward the most frequent sources of anger are found in conflicts with authority over routine matters; the desire to do things independently; and social difficulties with both parents and playmates. For instance, children may dislike to be washed, may refuse to go to the toilet, may want to button their clothes themselves, may refuse to do as parent or playmate requests, may want their way in play, or may be unwilling to share their toys and possessions with others.

When thwarted, the child under three years of age reacts quite violently by screaming, kicking, or holding the breath. The energy is of an explosive type and usually is not directed against any specific person or thing. As he matures, however, his expressions of anger are directly aimed at some particular object or individual. Common methods of attack are "pulling, pushing, running away from or at the offender; reaching, grabbing, or throwing objects; and pinching or biting."⁶⁴ Spitting may also occur, especially upon persons of whom the child is jealous.

Retaliations of a verbal nature become more common with the establishment of speech and may serve as substitutes for the physical reactions enumerated above. "Talking back," "arguing," "fussing," "scolding," "whining," "snarling," "mumbling," "muttering," "calling names," and "raucous laughter" may occur,⁶⁵ and, in some children, swearing. Crying and screaming take place frequently. Temper tantrums⁶⁶ may appear at 14 or 15 months of age or even earlier, but happen most often between two and three and a half years. Thereafter, there is a noticeable decline until the age of nine, where there is another rise in their frequency. A considerable drop occurs at age 10, and by 13 and 14 tantrums have practically disappeared.⁶⁷ In this dramatic and violent type of temper outburst the child may scream, kick, hold his breath, bite, bang his head against

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*

⁶⁶ See F. K. Merry, "Temper Tantrums" in H. M. Rivlin and H. Schueler (eds.), *Encyclopedia of Modern Education* (The Philosophical Library, New York, 1943), pp. 821-822.

⁶⁷ L. Kanner, *Child Psychiatry* (Charles C. Thomas, 220 E. Monroe Street, Springfield, Ill., 1935), table, p. 276.

the wall, throw things, and curse. The following descriptions⁶⁸ are illustrative of the behavior which is characteristic of the temper tantrum:

"She throws things, bites, and uses terrible language."

"She kicks and screams and beats her head against the wall. The other day, she smashed the glass of our china closet with a spoon."

"He'll growl and roll on the floor."

"She just rears up and takes her fists and hits them. If she doesn't want to do something, she will grab hold of her clothes and say she is going to tear them off."

Outbursts of even such a violent nature generally do not last longer than four to five minutes and often less. After the age of two, boys display anger more frequently than do girls and are more subject to tantrums. As we have seen, the number of outbursts diminishes, but the aftereffects of the emotional experience may persist for a longer period of time, and sulkiness and resentfulness often follow.

In general, school-age children show less violent anger reactions than do those of the preschool period. Nevertheless, there is still a good deal of fighting, teasing, pushing, jostling, and similar types of physical response, especially among boys. The verbal retort as a means of expressing anger, however, is used much more frequently, and this trend continues into the high school years and beyond. Name calling, ridicule, sarcastic remarks, appeals to authority (like threatening to tell teacher or mother), and gossiping are well-known examples.

Mild anger is experienced frequently by older children and adolescents. Such annoyance, while not giving rise to pronounced anger reactions, does, nevertheless, interfere with the individual's adjustment and may predispose him to more violent expressions of temper. A group of 285 sixth-grade boys and girls from Cincinnati⁶⁹ was asked to list things which annoyed, irritated, or bothered them. Later, these items were incorporated in an inventory, and the children were requested to check them according to the degree of their dislike for them. Boys do not want to be blamed for something

⁶⁸ *Ibid.*, p. 277.

⁶⁹ R. Zeligs, "Social Factors Annoying to Children," *Journal of Applied Psychology*, 1945, 29:75-82.

which they didn't do. They are annoyed by people who cheat or who do unfair things. In family situations they do not want to be whipped, especially for something which they didn't do, nor do they like to be scolded. In school they do not want to receive low marks, and dislike teachers who have pets, preach, or send them to the principal. They hate those who curse or tell lies. Girls show a far greater variety of annoyances than do boys, and these are concerned more with social situations. They dislike to see people getting killed, or those who suffer, and are disturbed if accused of something they didn't do, or if called a cheater. At home girls do not wish to make their parents unhappy or to irritate their mothers, and dislike being spanked, punished, or scolded. Bad report marks and not knowing their lessons are hated, as is also the necessity of having their mothers come to school. In their personal conduct girls hate bad habits, biting fingernails, and telling lies. It is interesting to note that whereas boys did not list girls as sources of annoyance, the girls considered "boys who make love to me," "being teased about boy friend," and "kissing games at parties" as annoying!

Many of the causes of anger and annoyance among older children persist into the teens. As would be expected, there is an increasing emphasis upon episodes concerned with social relationships. The table on page 354⁷⁰ presents common sources of disagreement between boys and girls and their parents.

A more recent study⁷¹ of the reasons for punishing adolescents shows many of the same sources of friction with parents.

Children begin to experience the complex emotion of jealousy early in life, and it may be quite a problem during the preschool years. One of the most frequent causes of jealousy is the arrival of a new baby, although the child may be jealous, also, of the attention given by one parent to the other, or to another adult. Sometimes the jealousy of baby sisters or brothers may be so intense as to constitute a real danger. Cases have been reported in which babies have been harmed or killed by jealous siblings, and methods of physical attack, such as pinching, slapping, and kicking, are quite common. When such direct attacks are not employed, the child may resort to

⁷⁰ From R. S. and H. M. Lynd, *Middletown*, p. 522 (By permission of the publisher, Harcourt, Brace and Company, Inc., New York, 1927.)

⁷¹ L. H. Stott, "Home Punishment of Adolescents," *Journal of Genetic Psychology*, 1940, 57, 415-428.

| Sources of Disagreement Between Parents and Children | Boys | | Girls | |
|--|------|--------------|-------|--------------|
| | No. | Per- cent | No. | Per- cent |
| Getting in at night | 158 | 45.4 | 163 | 42.7 |
| Number of times out on school nights | 157 | 45.1 | 182 | 47.6 |
| Grades at school | 140 | 40.2 | 119 | 31.2 |
| Spending money | 130 | 37.4 | 110 | 28.8 |
| Use of the family car | 124 | 35.6 | 113 | 29.6 |
| Choice of friends | 87 | 25.0 | 103 | 27.0 |
| Church and Sunday School attendance | 66 | 19.0 | 71 | 18.6 |
| Home duties (tending furnace, cooking, and so forth) | 66 | 19.0 | 101 | 26.4 |
| Mode of dress | 55 | 15.8 | 94 | 24.6 |
| Going to unchaperoned parties | 53 | 15.2 | 105 | 27.5 |
| Sunday observance, aside from going to church and Sunday School | 50 | 14.4 | 53 | 13.9 |
| Other sources of disagreement | 33 | 9.5 | 32 | 8.4 |
| Membership in clubs and societies | 19 | 5.5 | 40 | 10.5 |
| Do not disagree | 7 | 2.0 | 8 | 2.1 |

more subtle techniques. He may vent his jealousy upon dolls or pets, or he may try to gain parental attention by being loud and boisterous, or by regressing to such infantile behavior as wetting or soiling himself.⁷² Some degree of jealousy among brothers and sisters probably is present in every family group, as is evident in the following incident related by a boy on the "Child's World" broadcast. He was jealous of his sister who got attention from her father because of her dancing.

"Even though I think she dances like a hippopotamus, she makes my father give her attention and it makes me mad. Sometimes when she's bad I tell her I have a present for her. She starts whining, 'Please let me have the present,' and I tell her, 'Oh no, you've been bad.' And she starts to be good. I once gave her a kick in the pants and said that was her present and she went yelling to my mother."⁷³

As the child grows older and makes a greater variety of social contacts, the jealousy of siblings usually decreases. It may be prolonged,

⁷² Consult "Sibling Rivalry" by H. Bakwin and R. M. Bakwin in R. B. Winn (ed.), *Encyclopedia of Child Guidance*, pp. 400-401.

⁷³ "Child's World: New Program Airs Juvenile Ideas on God, Jealousy, Death," from *Life*, August 2, 1948, 25:79-83. Excerpt quoted from p. 82. (By permission of *Life* and of Miss Helen Parkhurst, program director.)

however, if parents show favoritism or animosity toward one child either knowingly or unwittingly. Unfavorable comparisons made either by parents or teachers, and the tendency of some teachers to make "pets" out of certain children, also, will arouse and prolong jealousy.

With the heightening of sex interest during and after adolescence, rivalry for attention from members of the opposite sex brings a new source of jealousy. The fickleness of youth tends to counteract the effects of sexual jealousy somewhat, but it may lead to serious problems, nevertheless. This type of jealousy, however, is perhaps the most pervasive and insidious in adult life, and is the root of many marital difficulties.

As was indicated earlier in this chapter, anger is the response usually made to situations which thwart or frustrate the individual in some way. Numerous studies on the effects of frustration, however, show that by no means do all individuals react to it by anger or aggression. How a person will behave when confronted with a frustrating situation depends largely upon such factors as age, past experience, social background, the nature of the frustrating circumstances, and his interpretation of them. In one investigation,⁷⁴ for example, children were asked to do the Goodenough Draw-A-Man Test, (see p. 258), 15 times. After each successive trial they were told to: "Draw another man; this time a better one." There were great individual differences in the children's reactions to this type of progressive frustration. In general there was a decrease in time spent on the drawing and the number of comments made. The quality of the product declined, as did also the mental age rating on the test. The degree of frustration tolerance varied widely, however, among the children in the experiment. A few gave up as early as the fifth trial; others persisted through the fifteenth. Some were quite disturbed, while others remained fairly calm. Several of the children sought to alleviate the effects of frustration by varying the task. One boy wrote his brother's name,⁷⁵ and others added such items to their drawings as trees, flowers, or a street scene.⁷⁶ Some talked more than others, used friendly threats, and wondered how many more drawings they had to do.

⁷⁴ H. G. Seashore and A. Bavelas, "A Study of Frustration in Children," *Journal of Genetic Psychology*, 1942, 61:279-314.

⁷⁵ *Ibid.*, p. 312.

⁷⁶ *Ibid.*, p. 291.

An experimental study of seven newborn infants⁷⁷ showed that pronounced reactions to frustration in connection with the hunger drive occur at this early age, and that significant individual differences exist.

An investigation of preschool children in a frustrating play situation⁷⁸ revealed a decrease in constructive play, an increase in unhappy expressions, motor restlessness, and aggressive behavior such as biting, kicking, breaking, and destroying.

In another study of nursery school children between two and four years of age, where teachers tried to frustrate certain children, aggressive behavior did not result, but rather submissive negativism, as crying and noncooperation.⁷⁹

It has been suggested that frustration gives rise to three main types of reactions. (1) extrapunitive; (2) intropunitive; and (3) impunitive.⁸⁰ In the first of these are included aggressive reactions toward others; in the second, aggression is directed toward the self; and in the third, the individual accepts the inevitability of the situation and does nothing. Which of these three types of reactions will occur depends upon the person's background and his interpretation of the situation. Anger is not the only emotional response produced by frustration; hostility, jealousy, fear, anxiety, feelings of inferiority, and shame may result also.

Methods of coping with anger vary with the nature of the offense; the age, health, and motive of the individual; the home environment; and the parents. Different parents employing the same methods secure different results,⁸¹ and techniques which bring about immediate obedience may not be the best in the long run. This is especially true if the child feels that they are unjust or unduly severe, or that the parent is inconsistent.

⁷⁷ D. P. Marquis, "A Study of Frustration in Newborn Infants," *Journal of Experimental Psychology*, 1943, 32:123-138

⁷⁸ R. G. Barker, T. Dembo, and K. Lewin, "Frustration and Regression," in Barker, Kounin, and Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 26.

⁷⁹ N. Frederiksen, "The Effects of Frustration on Negativistic Behavior of Young Children," *Journal of Genetic Psychology*, 1942, 61:203-226, particularly pp. 222-223.

⁸⁰ S. S. Sargent, "Reaction to Frustration—A Critique and Hypothesis," *Psychological Review*, 1948, 55:108-114 (These types are quoted from Rosenzweig.)

⁸¹ Goodenough, *op cit*, chap. 6.

Indications are that parents use physical force, coaxing, ignoring, and diverting attention with small children, and scolding, threatening, reasoning, and isolation with older ones. They also tend to use ignoring with girls, and bribery, threatening, spanking, isolation, and depriving of privileges with boys. The issue is often yielded entirely with smaller children, but compromises are more characteristic in dealings with those who are older. It must be emphasized that no one method can serve as a "cure-all" for handling anger episodes.

In controlling anger in small children, it has been found helpful to guard the child's general health and physical condition, and to provide a regular routine for him. This schedule should include opportunities for relaxation both before meals and at bedtime. It should be remembered, too, that the child's own ineptitude, because of immaturity, often is the source of anger, and that this will lessen with increased age and the acquisition of skill.

Parents themselves can aid by maintaining poise and self-control, and by encouraging a friendly home atmosphere. Consistency and coöperation in punishing are very important, also. Legitimate opportunities for getting attention should be provided, and parents should refrain from using such questionable methods as coaxing, scolding, bribing, and physical punishment in controlling anger problems.⁵²

In dealing with temper tantrums it is vital to see that the child does not get his way as a result of his outburst. Some parents are afraid that the child may injure himself by these tantrums, but such fears are groundless. After a temper outburst is over, the child should be permitted to join the family group without being reminded of or reproached for his behavior.

When one reviews the sources of friction between parents and older children it is obvious that many of these are unnecessary. This does not mean the abandonment of parental discipline, but rather the adoption of a policy of wise and firm guidance, which gives the individual increasing responsibility and does not make issues of trivial and inconsequential matters. Parents must realize, also, that after adolescence the conduct of their boys and girls is regulated to a great extent by the opinions and standards of other young people. They can no longer hope, therefore, to dominate their children in the same way that they did in former years. Long and fruitless argu-

⁵² W. E. Blatz, *Understanding the Young Child* (William Morrow and Company, Inc., New York, 1944), chap. 5.

ments should be avoided, and wherever possible the standards of conduct imposed upon young people should be reasonably consistent with those required of their peers. In so far as possible adolescents should not be spied upon and embarrassed, but should be trusted and treated as mature individuals.

Probably the greatest single way of reducing jealousy is for parents and teachers to treat children and adolescents impartially. When open favoritism is shown to one individual, it is certain to cause jealousy in other members of the family or class. Although it is wise to prepare the small child for the advent of a new brother or sister, it must be remembered that he is not usually mature enough to understand all the implications of such an event. A three-year-old boy, for example, was told rather early that he might look forward to having a baby brother or sister. As time passed and nothing materialized, he grew impatient, and finally informed his parents that he would rather have a dog! If a child is still given his rightful amount of attention, and if the parents make him feel that the new baby belongs to him as well as to them, extreme jealousy may be averted.

Since frustration is a universal experience which all must encounter sooner or later, it is important that the individual begin to develop constructive attitudes toward it as early as possible. In an experiment⁸³ designed to teach preschool children how to meet failure more adequately, they are encouraged (1) to persist longer when confronted with a difficult task, (2) to be less dependent upon adults for help, (3) to make fewer excuses for their failures, and (4) to attack and finish a problem without becoming disturbed. Following these four methods improved the children's chances for success materially even in so short a period as six weeks. It is evident, therefore, that getting even a small child to interpret a frustrating situation constructively will cause him to persevere and attain at least some measure of success. The importance of developing such a constructive attitude in older children and adolescents is obvious. No one who gives up too easily or who resorts to temper outbursts or indirect adjustment mechanisms whenever he meets frustration can hope to get far in our complex society.

⁸³ M. E. Keister, "The Behavior of Young Children in Failure," in Barker, Kounin, and Wright (eds.), *op. cit.*, chap. 15, especially p. 434.

LOVE

From the genetic standpoint it is generally agreed that love originates in response to organic satisfaction, i.e., a feeling of general well-being. Since the child cannot look after his physical needs, but is dependent upon the mother or nurse for such attention, it is natural that he should associate them with a feeling of comfort. Thus the child's first "affection" usually is centered upon his mother, or whoever takes her place. This may be evidenced as early as the eighth to twelfth month, and is illustrated, as already mentioned, by certain types of approach, such as smiling, laughing, fondling, patting, kissing, etc. In the normal course of development the child transfers a part of this affection from the mother or parents to other individuals, especially playmates of both sexes. This emotional weaning is necessary for the child's social adjustment, and parents who attempt to monopolize his affection may seriously retard his emotional development. It is not until the coming of adolescence, however, that love, based primarily upon sex, appears. Nevertheless, even the young child shows some sex interest and responds to sexual stimulation, which may lead to behavior problems unless properly understood and guided.

The problem of masturbation has its origin in the child's exploratory activities upon his own body. Parents seldom become disturbed when the infant tries to stick his toe in his mouth, or even when he resorts to thumb-sucking, unless it becomes chronic. If a child fingers his genitals, however, much concern is evidenced, and some parents become greatly agitated and alarmed lest it lead to insanity or moral depravity! While it is agreed generally that masturbation is an undesirable habit and should be broken if possible, no dire results will accrue from it if parents exercise judicious control and take a normal attitude toward its practice. However, if parents discuss this problem with others in the child's presence; if they try to frighten him out of it, or if they make him feel he is abnormal or a social outcast because of it, there is no doubt that serious harm will be done to his personality and social adjustment.

Some form of masturbation may occur at all age levels, but it is more common between 2 and 6 and 12 and 20 years.⁸⁴ It is probably

⁸⁴ *When Children Ask About Sex* (Child Study Association of America, Inc., 221 W. 57th Street, New York 19, N.Y., 1943, 16 pp.), see p. 5.

much more prevalent among boys than among girls, but up to the present time there is more information available about this habit in males than in females.

We are using the term "masturbation" in a broad sense covering everything from the incidental handling of genitalia by young children to the deliberate self-stimulation for definite sexual gratification of older individuals.

Kinsey, Pomeroy, and Martin say that the incidence of masturbation is greatest between 16 and 20 years, when 88 percent of the male population is involved.⁸⁵ They use the term in its more restricted sense, however, limiting it to deliberate self-stimulation.

A questionnaire survey was conducted of the sex beliefs and practices of 111 male college students ranging in age from 17 to 23, but with 70 percent either 19 or 20 years old. Masturbation was reported by 103, or 92.8 percent of them. Forty-six percent of first experiences with the practice occurred at the ages of either 13 or 14, and 83.8 percent said they had masturbated within the past 12 months.⁸⁶

In an older study 60.3 percent of 1080 college women admitted the practice of masturbation.⁸⁷ There is evidence, too, that almost twice as many girls as boys who masturbate generally begin the practice before 11 years of age.⁸⁸

Whether or not masturbation is to be regarded as serious depends largely upon the individual concerned, his social background, and his attitude toward the practice. The manipulation of genitalia in young children probably is to be regarded merely as an undesirable habit similar to bad table manners or nose-picking.⁸⁹ It may become a problem, however, if used as an escape from reality or as a substitute for other interests and activities. The harmful physical and mental effects which are commonly believed to result from masturbation have not been substantiated by scientific investigation. Even what might be considered as excessive masturbation at any age does

⁸⁵ A. C. Kinsey, W. B. Pomeroy, and C. E. Martin, *Sexual Behavior in the Human Male*, p. 238

⁸⁶ F. W. Finger, "Sex Beliefs and Practices Among Male College Students," *Journal of Abnormal and Social Psychology*, 1947, 42:57-67.

⁸⁷ As quoted from K. B. Davis, *Factors in the Sex Life of Twenty-Two Hundred Women* (Harper & Brothers, New York, 1929), in S. D. Porteus, *The Practice of Clinical Psychology* (American Book Company, New York, 1941), p. 281.

⁸⁸ C. M. Louttit, *Clinical Psychology* (Harper & Brothers, New York, rev. ed., 1947), p. 352.

⁸⁹ See *When Children Ask About Sex*.

not appear to be physically debilitating, or to lead to any form of insanity.

Undesirable psychological effects, however, may accompany habitual masturbation, especially after adolescence. If the individual believes it to be socially taboo, or to be harmful to his health, he may develop feelings of guilt, self-consciousness, and inferiority, which will be damaging to his personality.⁹⁰

In addition to evidences of masturbatory activity, many parents become greatly worried about the sex play exhibited by young children. This either may occur between members of the same sex or may involve individuals of both sexes. Like masturbation, most of this sex play is the result of curiosity and exploratory activity and probably has little, if any, sexual significance. Small children usually wonder about the physical differences between the sexes, and if their curiosity can be satisfied in an acceptable manner, no serious problems need arise. If too great an issue is made of incidental sex play, however, children may develop attitudes of fear and shame, which will interfere with wholesome sex adjustment.

It must be remembered, too, that youngsters are indefatigable imitators, and if they are permitted to witness the sexual relationships of older individuals, as often happens in the lower social classes, they will try to copy such behavior.

Sex play with members of the same sex is referred to as homosexual activity. It begins in boys as early as nine years,⁹¹ and frequently persists into adolescence and adulthood. In fact, Kinsey, Pomeroy, and Martin found it to be much more prevalent than is commonly supposed. Of the youngest group of unmarried males which they studied, more than a quarter, 27.3 percent, had had some homosexual experience, and the proportion increased with age.⁹² This relatively high percentage of homosexuality may be accounted for in part by the greater accessibility of members of the same sex. It may result, too, from the desire of preadolescent and early adolescent boys to exhibit their sexual prowess as an evidence of maleness and sophistication.⁹³ The disdain for girls which is characteristic of the "gang age" also contributes to the incidence of homosexual practices during these years.

⁹⁰ Porteus, *op. cit.*

⁹¹ Kinsey, Pomeroy, and Martin, *op. cit.*, p. 168.

⁹² *Ibid.*, p. 259.

⁹³ *Ibid.*, pp. 168-169

Although homosexuality is supposed to occur less frequently among girls, a survey of 1181 single women who were college graduates showed that 51.2 percent admitted having had homosexual experience. Of these, 43.5 percent began such practices before entering college, while 35.5 percent initiated them during college.⁹⁴ This would seem to indicate that homosexual activity may be fairly common among adolescent girls. It suggests, also, that many girls acquire the habit during their college careers. As a matter of fact, situations where large numbers of individuals of the same sex are housed together, such as in dormitories, fraternities, sororities, and institutions, are conducive to the development of homosexual practices. Unfortunately, they provide an excellent opportunity for individuals addicted to homosexuality to communicate their habit to others.

If homosexual practices persist into adolescence and adulthood, they may interfere seriously with the individual's normal adjustment to members of the opposite sex. They may become the preferred means of sexual expression, thereby causing the individual to seek contacts exclusively with his or her own sex. As in the case of masturbation, the social disapproval attached to homosexuality may give the individual who engages in it a feeling of guilt and inferiority.

A generally less serious form of homosexuality is the adolescent "crush," in which an emotional attachment is formed for some individual of the same sex, usually an older person. Crushes occur more frequently among girls than among boys and often persist longer. Ordinarily, however, they are temporary and, if handled understandingly, will soon disappear. Sometimes high school teachers find such attachments inconvenient and embarrassing. Their duration often can be shortened by finding numerous and somewhat disagreeable chores for the admirer to perform, like cleaning inkwells and washing desks and blackboards.

Actual contacts between the adolescent and the object of his or her admiration seldom occur. It happens occasionally, however, that unscrupulous men or women deliberately encourage crushes in order to initiate the younger individual into homosexual practices.

It is important to draw a clear distinction between homosexual *interests* and homosexual *practices*. As we shall see in the following

⁹⁴ Louttit, *op. cit.*, p. 358.

chapter, children in the preadolescent and early adolescent years are attracted primarily to members of the same sex because of similar interests. At this time, too, there is a real or professed distaste for members of the opposite sex, and group pressure favors the formation of friendships within the sexes. Such friendships may continue throughout the adolescent and early adult years, especially in the case of girls. They are not necessarily unwholesome, unless they are so intense that they prevent the development of normal interest in the opposite sex. Generally, however, these attachments break up in later adolescence when the unisexual "gang" becomes the "crowd," made up of both boys and girls.

Crushes are not always confined to members of the same sex. Adolescent girls sometimes form attachments for older men, even though the object of their affection may not be aware of it. Boys, too, frequently fall in love with women teachers and sometimes embarrass them with their open display of devotion. As in homosexual crushes, however, these soon wear off, especially if the older person discourages them without hurting the adolescent's feelings.

The interest which boys and girls evince in each other after adolescence and the activities resulting therefrom usually are described as heterosexual. Among these, caressing and fondling are prominent, and frequently are a source of disturbance to parents and other adults because they fear that such behavior may lead to sexual promiscuity. Activity of this kind is commonly called "petting," but it has been given various names by different generations, ranging from "bundling" to "pitching woo." Although the name may differ, the process of adolescent love-making does not appear to have changed materially. It has been suggested, however, that deliberate petting to the point of sexual climax is perhaps more frequent at the present time than it was in former generations.⁹⁵ The degree to which petting is to be regarded as undesirable depends to a great extent upon one's point of view. Certainly, it would seem to be impossible to prevent love-making among young people, even if it were desirable to do so. However, when petting is used intentionally as a means of sexual stimulation and gratification, it may have an adverse effect upon the individual's ability to adjust to normal marital relationships later on.

As with other emotional problems, the guidance and control of

⁹⁵ Kinsey, Pomeroy, and Martin, *op. cit.*, pp. 245-249.

sex behavior depends mostly upon the individual and the specific nature of the problem involved. A few general suggestions, however, may be helpful.

In order to deal effectively with masturbation in children,⁹⁶ the parent should endeavor to find out the cause or causes underlying it. Physical irritations such as worms, constipation, adhesions, or acid urine may stimulate the child to masturbate. Clothes that are too tight may cause it. It may be resorted to, likewise, if a child is sent to bed as punishment when he is not sleepy and has nothing to interest him. Too soft a bed, or too much excitement before going to bed, occasionally causes this habit. A parent may unwittingly encourage it by riding the child on his foot or a stick, or riding horse, or by allowing him to play with children who masturbate.

Various methods have been employed to control this habit, with different degrees of success, depending upon the cause or causes which underlie it, the time and place of its occurrence, and the persons supervising the child. Restraints upon the hands, such as tying them or covering them with mittens, usually are ill-advised remedies because they focus too much attention upon the habit and thus accentuate it. Proper diet and elimination, good general health, loose clothes, the avoidance of shame, opportunities for relaxation, and normal activity which interests the child are probably the best suggestions that can be offered to break up masturbation. It has been said, also, that tension in the home resulting from parental friction may sometimes be responsible for this habit in children.⁹⁷ In such cases little can be done to break up masturbation in the child until the parents resolve their own emotional difficulties.

Controlling masturbation in adolescents and young people may be a more difficult problem. The first step, however, is to relieve the individual from any feelings of shame or guilt which he may have in connection with the practice. If his full coöperation can then be secured, and if he desires genuinely to rid himself of the habit,⁹⁸ progress in this direction may be possible. If masturbation is being used as a solace, or as a substitute for normal social experience, helping the individual to develop new interests and to form new friendships often will result in its being greatly reduced or even disappearing altogether.

⁹⁶ Louttit, *op. cit.*, pp. 353-356, D. A. Thom, *op. cit.*, chap. 17.

⁹⁷ Louttit, *op. cit.*, p. 354, as quoted from Boenheim.

As we have indicated already, much of the sex play of young children is relatively harmless. It can often be reduced or eliminated by giving the child truthful information about the physical differences between the sexes.

The development of homosexual practices often may be prevented by more adequate adult supervision of children's play activities. It is a question, also, whether or not it is desirable from this standpoint for boys and girls to attend non-coeducational boarding schools or colleges where they must associate almost exclusively with members of their own sex.

The encouragement of a wide variety of social activities for groups of adolescent boys and girls will aid indirectly in controlling excessive petting. If parents make home an attractive place where their children may bring their friends, and where their activities may be supervised unobtrusively, they need not worry about the youngsters' engaging in undesirable sex activity. It is important, too, that young people neither be teased excessively nor scolded and punished about boy or girl friends. Even if the attachment is really undesirable, such methods rarely accomplish anything except, perhaps, to drive the individual into clandestine relationships with the disapproved friend.

In handling all the foregoing types of problems, adequate and truthful information concerning sex matters is a basic requirement. As we have said, even young children are curious about sex and, as most parents know, ask innumerable questions concerning it.

In order to determine the nature of children's sex interests, an investigation was made by the Iowa Child Welfare Research Station⁹⁹ through house-to-house interviews, using parent advisers from the Women's Cooperative Alliance, Minneapolis, Minnesota. Data were gathered on 1797 children from 2 to 14 years of age living in 981 homes. According to the information thus obtained, children asked the greatest number of questions pertaining to sex between the ages of 4 and 10, with a definite decrease thereafter. The questions were summarized under the following eight groups:¹⁰⁰

1. The origin of babies, i.e., where babies come from
2. The coming of another baby

⁹⁹ K. W. Hattendorf, "Parents' Answers to Children's Sex Questions," *Child Welfare Pamphlet*, No. 30 (Bulletin of the State University of Iowa, Child Welfare Research Station, Iowa City, Iowa).

¹⁰⁰ *Ibid.*

3. Intrauterine growth, or how the baby develops within the mother's body
4. The birth process
5. Sex organs and their functions
6. Physical differences between the sexes
7. The father's part in reproduction
8. Marriage and its relation to childbearing

Adults who desire to give children sex information should do so naturally and without embarrassment. It is important that the child realize when and where it is appropriate to discuss such matters. It is also best not to volunteer more knowledge than is requested. Answers which seem to satisfy children are suggested for each of the above topics in Dr. Katharine Hattendorf's excellent pamphlet, and in Dr. Karl de Schweinitz's book entitled *Growing Up*,¹⁰¹ which can be understood by the average preadolescent child.

The following incidents illustrate wholesome attitudes toward sex which may be developed in children by giving them access to proper information (1) A third-grade boy and girl were overheard arguing about how big they were before birth. Finally the dispute was settled when the boy brought out Dr. de Schweinitz's book to prove his point that life begins from a very tiny speck. (2) Two small girls, one of whom had been given a simple explanation of the birth process, were discussing this subject in their playhouse. The uninformed child remarked that her mother had found her in a cabbage plant. "Oh!" replied the other scornfully. "You're just like a cabbage worm. My mummy *borned* me!"

It should be emphasized, however, that securing sex information from books, no matter how good these may be, cannot take the place of intelligent and sympathetic parental guidance.¹⁰² It is not only correct information which is important, but also the attitudes which are created toward all aspects of sex. This is true of older children and adolescents as well as for those who are younger. Fathers and mothers should explain to boys and girls the meaning of the physiological changes which accompany sexual maturation, and should encourage youngsters to regard them as normal and natural events.

There is some sentiment at present in favor of including detailed

¹⁰¹ Second edition, revised.

¹⁰² *When Children Ask About Sex*, p. 11.

information about human reproduction in hygiene and biology classes in the junior and senior high schools. Separation of the sexes for such instruction is favored by some, whereas others believe that this overemphasizes the "mystery" element. A wealth of material on sex education designed for older children and adolescents is now available, including a film called *Human Growth*,¹⁰³ depicting the reproductive process. One of the best sources of information concerning sex education is the American Social Hygiene Association.¹⁰⁴

There is probably no phase of human experience wherein differences in social class are so apparent as in the case of sex behavior. In their comprehensive study of male sex activity, Kinsey, Pomeroy, and Martin point out repeatedly that all aspects of sex behavior are influenced by educational and social status.¹⁰⁵ For instance, boys in the lower classes begin heterosexual relationships earlier than do those in the upper classes. The chances are much greater, also, that this behavior will persist into adolescence and adulthood. On the contrary, masturbation is more prevalent among males in the upper educational and social groups. Interestingly enough, the taboo against masturbation is strong at all social levels.¹⁰⁶ However, the disapproval attached to promiscuous heterosexual relationships is much less among the lower classes, so that this form of sexual expression is substituted for masturbatory activity. Because of the wide variations in sexual ethics existing in different levels of our society, it is questionable whether we should attempt to impose relatively strict middle-class standards upon individuals from *all* social strata. A more reasonable goal would seem to be to give all boys and girls, regardless of social class, such information and guidance concerning sex as will enable them to achieve the fullest measure of happiness in marital and family relationships during their adult years.

SUMMARY

An emotion may be defined as the response made by an individual when he is confronted with a situation for which he is unprepared or

¹⁰³ For information about this film, write to Dr. Lester F. Beck, Professor of Psychology, University of Oregon, Eugene, Oregon.

¹⁰⁴ For information about pamphlets and leaflets write to Publications Service, American Social Hygiene Association, 1790 Broadway, New York 19, New York.

¹⁰⁵ Kinsey, Pomeroy, and Martin, *op cit.*, chap. 10.

¹⁰⁶ Davis, "Child Training and Social Class," in Barker, Kounin, and Wright (eds.), *op cit.*, chap. 34.

which he interprets as a possible source of gain or loss to him. Profound physiological changes accompany emotion, usually but not invariably bringing about a rise in energy level and some degree of disorganization. The nature and intensity of the emotional reaction are determined largely by the character of the circumstances involved.

Most, if not all, of our emotional experience arises directly or indirectly from the dynamic action of drives and motives. Either the fulfillment or the thwarting of biological and social drives may provoke emotional responses, and emotions themselves may come to act as drives. The functioning of drives and motives, therefore, can never be separated from emotional behavior.

Although Watson popularized the idea that three specific emotional patterns—fear, anger, and love—are inborn, more recent research indicates that infants show no such definite emotional responses, but exhibit only generalized reactions which become specific through maturation and conditioning.

The physical changes that accompany strong emotion result from a shift in the autonomic nervous system. There is increased activity in the sympathetic division resulting in faster heartbeat, rise in blood pressure, interference with digestion, and a reinforcement of the voluntary muscles. In addition to changes in the autonomic system, neural discharge from the hypothalamus in the midbrain also is associated with emotional responses.

The subjective aspect of emotion can be studied only through introspection, which cannot be used with infants and small children and is not very reliable with adults. Its objective phases, however, such as the occurrence of physical changes, can be observed, measured, and recorded with some precision. Such observations will indicate the presence of an emotion and the degree of its intensity but will not tell generally what *specific* emotion the individual is experiencing. The most frequently used objective measures of emotion are pulse rate, blood pressure, and changes in the electrical resistance of the skin. Word association tests, psychoneurotic questionnaires, and tests of emotional attitudes are also employed frequently.

In guiding the emotional experiences of children and adolescents, the adult must be familiar with the types of situations producing them, and the principles underlying the different methods used in emotional control.

Of all emotional experiences, fears probably are of the least value because many of them are imaginary, block activity, and interfere with social development. Young children tend to fear concrete things or events, whereas older children fear the supernatural and objects remote from their experiences. Later they fear things which threaten their status or security.

The fears and worries of adolescence and youth are associated mostly with feelings of social inadequacy and with uncertainty over the choice of an occupation.

The association of pleasantness and success with the feared object or incident, when approached gradually, is considered one of the soundest techniques for eliminating or reconditioning fears both in children and in adolescents. Instruction in social skills, and more adequate educational and vocational guidance would assist materially in reducing the fears and worries of youth.

Anger in children is influenced by their age, sex, and environmental conditions. In small children its most frequent causes are the desire for attention, suffering from some minor physical discomfort, and objection to daily routine. As the child matures, anger results from conflicts over routine, self-help, and social difficulties with parents and playmates.

When angry the small child releases much undirected physical energy of an explosive type, but as he grows older his expressions of anger become less violent and are aimed directly at some particular object or individual. Later he substitutes words for physical abuse, and although the outward display of anger does not last long, the aftereffects persist and often are followed by sulkiness and resentment.

Anger and annoyance in older children and adolescents result more frequently from conflicts with parents and teachers over home duties, school tasks, and social activities.

The most frequent source of jealousy in young children is the arrival of a new baby in the family. The favoritism of parents and teachers is a major cause of jealousy with older children and adolescents.

Although frustration often gives rise to anger and aggressive behavior, this is by no means invariably the case. How an individual will behave when confronted with a frustrating situation depends largely upon such factors as age, past experience, social background,

the nature of the frustrating circumstances, and his interpretation of them.

In controlling anger, parents tend to use physical force, ignoring, and diverting attention with small children, and scolding, threatening, reasoning, loss of privileges, and isolation with older children and adolescents. In the final analysis, however, the nature of the offense, the age, health, motive of the child, and home environment should all be considered.

Many of the sources of friction between parents and older children are unnecessary and could be avoided without weakening parental prestige.

Jealousy of a new baby may be prevented both by preparing the child for its arrival and by making him feel that it has not usurped his place in the family. Impartiality on the part of both parents and teachers will reduce jealousy in older children and youth.

It has been shown experimentally that constructive reactions to frustration can be developed by training, even in young children.

Although love based essentially upon sex usually does not appear until adolescence, even young children show sex interests and respond to sexual stimulation. Masturbation is a common problem of childhood and youth and is not an indication of moral depravity or a cause of insanity.

The sex play of young children generally results from curiosity and is not to be taken too seriously.

Homosexuality in both boys and girls may develop early and may be accentuated during the preadolescent and early adolescent years when there is a professed distaste for members of the opposite sex. If masturbation and homosexual practices persist into adolescence and youth, they may interfere seriously with normal sex adjustment.

The heterosexual interests and activities of young people sometimes are a cause of worry to adults. It is probable, however, that these are no more of a problem today than they were in past generations.

The best methods for controlling masturbation are a constructive parental attitude; attention to the child's physical condition, relaxation, and daily routine, and the provision of a variety of interesting activities for him.

Dealing with masturbation in adolescents and young people is a

more difficult problem. If feelings of shame and guilt connected with the practice are removed, however, and if the individual really wants to get rid of the habit, some progress may be made.

The development of homosexual practices often may be prevented by more adequate adult supervision of children's play. The encouragement of a wide variety of social activities for groups of adolescent boys and girls will aid indirectly in controlling excessive petting.

Children's curiosity concerning sex seems to reach a peak at 10 years of age, and they ask questions upon almost every phase of the subject. Such questions should be answered truthfully and without embarrassment, and children should be instructed as to the propriety of discussing this topic. If sex information is not given properly, excessive curiosity may develop and this, in turn, may result in unwholesome attitudes and practices. It should be remembered, however, that even the best literature on sex will not take the place of parental guidance. Young people, also, should be given full information about human reproduction, and a variety of material is now available for this purpose.

Differences in social class probably are more apparent in relation to sex behavior than in any other field of human activity. It would seem to be wiser to try to give all boys and girls such information and guidance as will promote their maximum sex adjustment than to attempt to make everybody conform to the standards of sexual ethics characteristic of any one social class.

The gaining of emotional maturity is one of the most important factors in social development. In the next chapter, therefore, we shall concern ourselves with a discussion of how the individual becomes socialized.

SUGGESTED ACTIVITIES

1. Witness a demonstration of the Keeler polygraph or the psychogalvanometer in the psychological laboratory of your college or university. If this is impossible, you might be able to get permission to see the lie detector at work in a local law-enforcement agency.
2. Ask your instructor to administer one of the psychoneurotic questionnaires mentioned in this chapter, and note your strong and weak points.
3. Have each member of the class submit anonymously his major fears and worries listed in order from the most to the least troublesome.

Appoint a committee to classify these and report to the class as a whole.

4. Keep an anonymous diary of the number and nature of your anger experiences over a period of one week. The group will appoint a committee to summarize this material and present it to the class.
5. Report to the class, withholding names, any case of temper tantrums with which you are familiar, and tell how the problem was handled.
6. Report to the class, withholding names, examples of parents whom you know who use modern techniques of sex education with their children, and the results which they obtain.
7. Discuss in class the facilities available in your community for providing wholesome social and recreational activities for teen-age boys and girls.
8. Report any instances you may know in which an individual's attitudes and behavior concerning sex are influenced by social background.

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C H A P T E R 10

HOW WE DEVELOP SOCIALLY

IMPORTANCE OF SOCIALIZATION

Up to this point in our description of the physical and psychological growth of the individual, we have taken for granted that this development occurs in a social environment. We have emphasized repeatedly that human growth does not take place in a vacuum, but is bound up intimately with all sorts of environmental conditions. Numerous references have been made to many of these factors, both physical and psychological, and their effect upon the individual. We must turn our attention now to a more detailed consideration of the way in which the human individual becomes a social being.

Hundreds of centuries ago man perceived the values to be gained from group association. Since then, one of the major tasks of every person is to learn to adjust himself to the group of which he is a member. He must learn not only that such group living brings advantages to him but also that he must contribute to the welfare of others, often by modifying or foregoing his own desires. This social give-and-take does not develop in a haphazard manner. The human infant, as we shall see, is largely nonsocial. Although he is completely dependent upon others for his survival, he is not aware of this, nor does he at first differentiate those who take care of him from others in his environment. It will be some time, also, before he will be able to recognize himself as a personality or individual distinct from other people and things around him.

We shall endeavor to outline the general stages through which the normal individual passes in learning to live, play, and work with others from infancy to the end of the second decade. This process of

socialization is long and tedious, and constitutes one of the major developmental tasks faced by everyone. Like many other complex aspects of growth which we have discussed, it is not a matter of maturation alone, but involves, also, adequate opportunities for learning and practicing social habits and skills. Nevertheless, we must remember that many such habits and skills cannot be acquired until a certain level of maturity has been reached. This is evident particularly in the earlier stages of social growth, when the child may be too undeveloped to respond to social stimulation.

One can hardly overestimate the importance of social development in the human being living in the modern world. He not only must learn to get along with those in his immediate environment but must progressively assume responsible membership in constantly expanding groups as well. He must become an active participant both in community affairs and in national problems. Furthermore, it is recognized now that with our modern means of communication and transportation it will be necessary for all peoples to extend their social horizon to embrace the entire world.

Such a "world view," however, cannot be imposed easily upon the mature individual. Instead, it is the product of attitudes which have their inception in the family, school, church, and community. The real foundations of world citizenship must be laid early in life.

In this chapter, then, we shall consider the principal phases of the individual's social development from birth to the age of 20. These will include principally his relationships to his peers and to individuals older or younger than himself, in the home, at school, and in play groups. We shall discuss, also, some of the techniques which have been devised for measuring the individual's social adjustment. Moreover, since play and recreation comprise so large a part of one's socialization, we shall list some of the materials and activities appropriate for various age levels.

HOW THE INDIVIDUAL BECOMES SOCIALIZED

THE PRESCHOOL CHILD¹

At birth the baby has no perception of his relations to others. He acquires it slowly through the handling and care he receives from

¹ M. M. Shirley, *The First Two Years*, Vol. III; K. M. B. Bridges, "A Study of Social Development in Early Infancy," *Child Development*, 1933, 4:36-49; G. Murphy, L. B. Murphy, and T. M. Newcomb, *Experimental Social Psychology*, chap. 9; W. Dennis, "Infant Development Under Conditions of Restricted

adults, through manipulating objects, and through making contacts with other children. Before the age of three months the infant turns his head in the direction of people, follows their movements with his eyes, and is quieted by the human voice.

Crying at first is an accompaniment of mass activity, or results from certain needs, such as hunger or pain. It is not until about the third month that crying is associated with people and thus becomes a social response. Since the mother usually cares for the baby, she is the one with whom it first establishes social relationships. This begins as soon as the infant stops crying when he hears her voice, when he sees her approach, or when she picks him up. At first the baby does not discriminate a friendly from a scolding tone, and is quieted by either.

Like crying, smiling at first has no social significance. It is simply reflex activity, and may result from visceral stimulation or from a light touch upon the cheek.

In an extensive experiment on 139 male and 112 female babies, including white, Negro, and Indian,² it was found that no smiling occurred under 20 days of age, and that only 2 percent of these infants smiled before the end of the second month. Between three and five months, however, 98 percent of the group had acquired a social smile, i.e., they smiled in response to a smiling face. It was found further that the first social smile is not evoked by the expression in the human face, but rather by certain elements, such as two eyes, the forehead, and the nose, plus motion. This was confirmed by checking the reactions of the babies to masks donned by the experimenters, and also to a nodding puppet. Even this scarecrow, which bore some resemblance to a human being, could elicit a smile if it nodded its head!

It is interesting to note that smiling is universal in infants from three to six months, regardless of race or cultural background. It occurs, also, even when there is a minimum amount of social stimulation.³ After the sixth month, however, smiling to anybody and everybody disappears.

Practice and of Minimum Social Stimulation," *Genetic Psychology Monographs*, 1941, 23:143-189.

² R. A. Spitz and K. M. Wolf, "The Smiling Response: A Contribution to the Ontogenesis of Social Relations," *Genetic Psychology Monographs*, 1946, 34:57-125.

³ Dennis, *op. cit.*

In addition to smiling, other forms of social behavior are apparent around three months. The infant may express his pleasure in the company of children or grownups by kicking, cooing, and laughing aloud. Anticipatory reactions, like wanting to be taken up or lifted, are marked by the fourth and fifth months. About this time, too, the infant is beginning to distinguish familiar persons from those whom he does not know, and may stare at or frown upon strangers.

After the sixth or seventh month he may respond to playful advances, pull hair, explore features, and grab noses of people he recognizes, but may withdraw from strangers and cry.

Between seven and eight months he may stretch out his hands and jabber to someone he knows. By nine months the baby is eager for attention and will even pull upon a grownup's clothing in order to secure it.

At 10 months he may offer an object to an adult and imitate movements, as "shaking the head," "turning away," "repeating simple sounds," or "clapping hands." From 10 months to one year of age the child learns the rudimentary speech sounds, comprehends the meaning of simple sentences, and will stop doing things when so requested. During this time, also, his social and playful behavior are well illustrated by the reactions which he has to his mirror image.⁴ He not only looks at the reflection of his face but leans forward and kisses it as well. He may poke at the mirror or pat it, as in playing pat-a-cake.

Most of the child's early play, however, is nonsocial and consists mainly in acquiring sense impressions and motor experiences. At about the time creeping starts the child is beginning to develop greater facility in manipulating things, and there is a noticeable increase in his play activities. He reaches, grasps and manipulates objects, dropping and throwing them, and pushing them away when he doesn't want them, instead of turning away as he did earlier. He likes small objects and still puts them in his mouth, but he also bangs and shakes them. He can open and close small boxes and pokes his fingers into things.

Even greater variety is shown in the child's play behavior after he can walk, for he now can move from one object to another, pushing or pulling it, in addition to the satisfaction which he gets in merely

⁴ A. Gesell and L. B. Ames, "The Infant's Reaction to His Mirror Image," *Journal of Genetic Psychology*, 1947, 70:141-154.

practicing walking. Household activities fascinate him, and there are many evidences of dramatic play.

From 15 to 18 months there is absorbed interest in adults and children, which is followed quite frequently by a period of obstinacy or negativism that may persist to the age of three and a half. The main reason for this type of behavior is the child's desire to be independent of adults.

Laughing and crying are forms of social behavior for children between 18 and 48 months of age.⁵ Laughing tends to increase, and crying decreases as the child grows older. As noted above, smiling occurs around the eighth week, but laughing not until the twelfth. Smiling increases greatly in frequency to the sixth month and then subsides, while there is no marked gain in laughter after the fifth month.⁶ The most effective stimuli for provoking laughter in the baby during the first year of life are such simple games as "peek-a-boo," "threatening with the head," and "rhythmical hand clapping."⁷ Two-year-olds laugh more when alone, whereas older children laugh more when with their associates. Those who laugh more frequently tend to play with children who laugh a great deal.

Around the time of school entrance there is an increase in smiling and laughing in circumstances involving "noises, grotesque faces and figures, dramatic situations such as someone falling down, funny dancing, bumping into each other, things falling upside down and inside out."⁸ Later the child laughs at "absurd physical phenomena, surprising relationships, word plays and incongruities."⁹ At first he laughs only at actual occurrences, but later sees the funny side of pictures, stories, and movies.

Neither laughter nor crying correlates with a child's mental age. Generally speaking, crying becomes less frequent with increasing maturity, and when it does occur, it is more likely to result from the actions of someone else than from pain to the child himself.

The interest of one child in another develops very slowly. Children of four and five months when placed together are scarcely aware of

⁵ C. W. Brackett, "Laughing and Crying of Preschool Children," *Child Development Monographs*, No. 14.

⁶ R. W. Washburn, "A Study of the Smiling and Laughing of Infants in the First Year of Life," *Genetic Psychology Monographs*, 1929, 6:396-537.

⁷ *Ibid.*, pp. 491-492.

⁸ J. C. Foster and N. E. Headley, *Education in the Kindergarten* (American Book Company, New York, 1936), p. 11.

⁹ *Ibid.*

each other's presence, but it was found that if one cries, the other will notice it.¹⁰ Children around six months of age may smile at each other and thereafter make active efforts to attract the other, as by cooing, squealing, touching, pulling the other's clothes, handing him things, or grabbing them from him. Around one year of age they may imitate each other's movements. Between 13 and 14 months imitative smiling and laughing may occur. The year-old baby plays alone but by 14 or 15 months he may play with another child, and will cry, bite, or hit the latter if he takes his toy. This is accidental behavior, but later on it may be done for fun, or result from a sense of thwarting.

Imitation plays an important role in the development of social behavior. Infants and children imitate each other and also older children and adults. When children do not have playmates they often resort to imaginary companions who may be either animals or other youngsters.

At Yale University an investigation was made of the different types of imaginative expression found among preschool children.¹¹ From interviews with parents or from the observation of play behavior, it was learned that at least 21 percent of the 210 children involved had some sort of imaginary companion. This occurs with approximately equal frequency in both sexes, and over half of the cases were "only" children. It is interesting that, although many of these "only" children had opportunities to play with others of their age, they did not get along well with them.

Imaginary companions occurred most often between three and four years of age with the peak at three and a half. The average duration for such a playmate was six months, but some lasted as long as a year or more. They seem to disappear by four and a half, but some may exist secretly until 10 years of age.

The authors of this study feel that the existence of imaginary playmates is a part of normal development and is characteristic, especially, of highly intelligent, verbalistic, and imaginative youngsters. Other writers feel that imaginary playmates are used because the child is lonely, or wants someone to boss, to blame for his misdeeds, or to represent his ideals.

¹⁰ Bridges, *op. cit.*

¹¹ L. B. Ames and J. Learned, "Imaginary Companions and Related Phenomena," *Journal of Genetic Psychology*, 1946, 69.147-167.

Human beings are more often used as imaginary companions than are animals. They may bear either an ordinary name or a fancy one, such as "Tulipka" or "Yuke-a-Tuke." If an animal is invented, it ordinarily is a dog or cat, but roosters, owls, foxes, birds, bears, or even snakes and worms appear also. The child resorts when very young to older imaginary playmates, later to contemporaries, and still later to those younger than himself.

In an experimental study¹² it was shown that between six and eight months of age the baby regards his playmate as play material. From 9 to 13 months he is more interested in the play material than in his partner, and the latter becomes an obstacle to his play. Fighting reaches a maximum at this time; this negative attitude, however, is called forth not by hostility but rather by the child's interest in the material. The period from 14 to 18 months marks a transition from interest in the material to interest in the partner as a playmate, and between 19 and 25 months a friendly attitude toward him is characteristic. The play materials now establish, rather than serve as obstacles to, social cooperation.

Children learn to play together in groups of three between 15 and 18 months, and in groups often as large as six or seven after the age of three. Much of this early group play is parallel in nature. That is, the child plays *near* others but not *with* them. In initiating social contacts, physical means are first employed, then things, and finally speech.¹³

Sex differences are not apparent in the social activities of preschool children. Boys will play with girls as readily as with other boys, and vice versa. Either sex will play with toys which are presumably intended for one or the other. Boys, for example, will play with dolls and doll carriages, and girls with wagons or guns.

Practically all experiments show that aggressive behavior increases with age during the preschool period, and that boys make more overt aggressive responses than do girls. There are great individual differences, however, due to varying home and cultural standards. Aggression serves either as a means for retaliation or as a compensation for feelings of inadequacy. Boys employ more physical tech-

¹² M. Maudry and M. Nekula, "Social Relations Between Children of the Same Age During the First Two Years of Life," *Journal of Genetic Psychology*, 1939, 54:193-215.

¹³ A. J. Beaver, *The Initiation of Social Contacts by Preschool Children* (Bureau of Publications, Teachers College, Columbia University, New York, 1932).

niques, whereas girls use more verbal methods and show submission. When boys and girls play together, the girls become more aggressive and the boys more submissive.¹⁴

The case of G. B., whose language growth is described in Chapter 6, illustrates some of the outstanding stages in social development and play during the preschool period. It will be noted, however, that some aspects of G. B.'s social behavior differ from the sequences we have outlined. This divergence shows how environmental conditions, such as adult stimulation and the presence of other children, may affect a child's development and account for individual differences in social maturity.

SOCIAL DEVELOPMENT OF G. B.

At four months: He responds with a smile and grins when you stick out your tongue at him or make a gurgling noise. He is much interested in people. At S.'s home he stared and stared at their 14-month baby girl.

One week before 5 months. The baby reaches out more for things. He pulls the tablecloth and bangs the dishes up and down. He is more and more active, rattles his rattle with his right hand, waves his right arm a great deal, and squeals a lot now instead of crying.

At 6 months. When I had G. sitting on the table by the window he saw some dogs in the yard and grunted and grunted while he watched them play. He does the same thing when he sees another baby, and he reaches out to touch them.

He can honk a bicycle horn and makes a rubber doll squeak.

At 8 months: G. lies on his back and entertains himself pretty well. He still likes to tear up paper, and if he pulls his covers or paper over his face he holds his breath, gets all excited, and has a big time. Then he pushes the covers down and grins, especially if you say "peek-a-boo" or "hi."

He rattles his rattle and shakes his doll back and forth. He swings his doll by a leg or string. When he lies on the table he kicks his feet straight up and sometimes grabs his toes.

We took him over to S.'s and this time he wanted to touch the baby. Once he grabbed at her.

A couple of weeks ago he was eating zwieback and throwing it on the floor. I thought I would try to get him more interested in it, so I asked him for a bite and pretended to take one. Of course, I told him how good

¹⁴ M. J. Muste and D. F. Sharpe, "Some Influential Factors in the Determination of Aggressive Behavior in Preschool Children," *Child Development*, 1947, 18 11-29.

it was. Now every time I ask him for a bite he offers it to me and sometimes even picks the zwieback off his tray.

He still loves to pull hair and noses. When he meets some people he reaches right out for their faces. He likes company and will let some people take him. G. always reaches out to feel other babies, especially their hands, and grunts and grunts at them.

At 9 months: G's father taught him to shake hands and took him all over town handshaking.

At one year G. enjoys knocking down his blocks as fast as we build them.

He is a little strange, especially with women, but is fond of J. and pulls his legs until he takes him on his lap.

At 13 months: If G. knows he isn't to do something, he turns around and looks at you and usually does it anyway!

Several little girls (aged two and two and a half) play with him in his sand pile. (G. was visiting his grandmother in a distant state.)

At 14 months: (Family returned home.) G. has a big time playing in his sand pile with Mary and Beverly. Yesterday he picked up an oil can and pretended he was telephoning Beverly has a toy phone which he delights to use.

At 15 months: G. must be getting his first molars. He is restless and does not want to sleep or eat much. Everything is "No, no."

At 16 months: G. is quite fond of his teddy, carts it around, and pats it. He tries to feed it and wanted it to sit in his high chair. He has so many toys, yet he will put them down and ask for the double boiler or the coffee pot.

At 17 months: G. and Beverly have been getting together more and are having a good time. Just in the last couple of days she wants either to come down here or have G. come upstairs. They are getting to be great pals. Yesterday they chased each other back and forth and yelled like a couple of Indians.

At 18 months: G. stands on a chair by the sink and thinks he helps me wash dishes. He hands me dishes to dry and keeps me hustling. He also clears the table and sometimes sets it.

He tickles Beverly and she backs into a corner. He tried it on Mary (who is three and one-half months older than he), and she took him by the shoulders and started to back him up, which he thought was great fun.

G. is quite an imitator. His father got a pipe for Christmas which he does not use, so G. draws on it and puffs like a veteran. He sits and rocks in his rocker, but every so often he hops up, runs over to the smoking stand, knocks the "ashes" out, and runs back to his chair again.

At 19 months. G. whoops and yells when he slides down the table board. He tries to dance, stamps his feet now, and turns around and around until he is dizzy.

He takes his little colored doll riding in the little red wagon, as well as his teddy.

One day I saw him go up to his teddy, sitting in his rocker, and say: "Wa wa?" He then offered teddy a drink from his bottle. He often rocks and loves him.

At 20 months: G. likes his ducky cart and drags it all over. His Peter Rabbit toy traveled down town with him several times.

He has been going to parties. Beverly was three on Thursday and invited 17 children. G. was the youngest and was a little abashed at first, but Beverly's mother kept him busy.

At 21 months. (The family moved.) G. doesn't see Beverly so much now, but when they do get together you should hear the racket. They whoop, yell, and race around. Beverly always insists upon kissing G. good-bye. Much to our surprise he sticks out his cheek.

He likes to help his father stack wood in the basement and to hang up my pans in the pantry.

At 22 months: G. likes picnics and has great fun playing in a tub of water in the yard.

He imitates everything we do. He chases the cat and pulls her tail. Occasionally he calls his father by his first name. G. can tell his name now and where he lives, and takes time to think whether he wants to mind or not.

At 23 months. G. builds towers of seven and eight blocks now. He is very independent and wants to do things himself. He certainly likes notice and approval.

At 25 months: G. picks up his little kitten by the tail. It claws the air frantically and he holds it out so it does not get him. Sometimes he picks it up, throws it, and says "boom!" Then again he cuddles it and pets it. He has taken it down to the edge of the bluff twice to see the trains.

Nig, another cat, plays nicely with G., who runs through all the rooms with a piece of paper tied to a string, the cat following him.

At 26 months: When G. says good-bye to anyone now, he adds: "Come to see us."

He has a highly developed sense of possession, and says "mines, mines," if you take something belonging to him. If the maid puts on my apron he yells "mama's."

This morning he helped dry a few dishes and then spread the towel on the floor. He said he and Beverly were going to have a picnic. He set his dishes around and then asked for a cookie which he broke up and put into

some of the cups After a while I asked him if he had finished his picnic, and he said Beverly did not come. Then he asked for water and had a tea party all alone.

At 27 months. Playing with a deck of cards, G. said (while laying them out on the table), "There is a spade . . . Oh! Phew! I missed a spade." He knows what is supposed to be in a deck, but he does not call a spade a spade. All the face cards are "Queens."

We visited Beverly the other day. G. loves to play with her pots, pans, and stove. When I make pie I always have some dough for him, and give him a board, roller, and pan.

He likes to cut with a scissors but usually cuts through the pictures instead of around them. When I sew he pretends he is sewing, and sticks pins through buttons.

At 28 months G. listens to the radio and picks out things people say. This morning he exclaimed. "Man said sunset!"

He likes his electric stove. For several days he cooked every time I cooked, and wore his apron when I did Whenever I iron, he must iron. He uses his broom and sweeper when I do He wanted a washer like mine and a hammer, but I told him Santa ran out of money and he would have to wait for these things until next year.

At 30 months. We have shelves for the toys now and G. is very good about putting his things away. He also takes great pride in showing them and keeps them very neat.

At 32 months G. pretends a lot . . . that he is entertaining little girls and that Georgie Porgie has come to see him.

He is very eager for the baby brother or sister to arrive. Occasionally he says he is saving something for his baby brother. He cannot get it straightened out whether it means a boy or girl. They both are the same to him.

At 33 months: Mrs. L. took G. over to her house on Wednesday. He ate dinner there and even had his nap with her.

He is very bashful when people talk to him on the street, unless they ask him a question about something in which he is interested. I took him and the baby to a women's party. He wouldn't come in, but stayed on the porch. It took him a long time to make up with several younger children, but everything was all right when a five-year-old boy came.

He pats the baby's cheek. Sometimes he tells me to put baby sister down and hold him. That is the only evidence of jealousy so far. We try to emphasize the fact that she is *his* baby sister and that he must help to take care of her.

G. works with his father and Mr. R. in the shop in the basement, and calls them by their first names. He feels he is one of the fellows.

At 37 months. G. changed a lot during the summer. He has lost much of his shyness and talks to people who come to the house. He also played with some children in the neighborhood. His experience at play school helped him mix with a group of children.

At 39 months. G. plays more with C, the baby. She will do just about everything he tells her. It's just too bad, though, if they both want to sit in the little rocker at the same time.

At 40 months: G. loves to tease C.

At 42 months: G. cannot get enough reading, and asks to be read to at all hours of the day and night. He likes "Sunny Bunny" and pretends to talk to him once in a while. "Peter Rabbit" is another imaginative playmate of his. He says that Peter and I do this and the other thing.

While I was washing, G. went up to a post and pretended to push a doorbell, saying, "Ling-a-ling." When I asked who was there he said it was the *Post* boy and held out an imaginary paper, and I paid him. Then he did it over and over. Finally he brought real papers until I had such a stack that I told him to send a rag man to buy them. In the meanwhile C. got the idea and rang my bell and sold *Posts* three or four times.

At 45 months. Both G. and C. like to play with the peg board and the ring toss game. They eat together at noon, and such giggles and fights!

At 49 months: G. loves school. He said a verse about ten little soldiers one day and he tells me what they play and sing.

THE SCHOOL-AGE CHILD¹⁵

It is probable that few adults realize what a significant event school entrance is in the life of the average child. We have seen that some social development takes place during the preschool period. Nevertheless, even though the child has learned to adjust himself to small, informal groups, he is still basically egocentric, and tries to get his own way by using crude, aggressive techniques. His social experience has become greatly broadened, and his interests and activities have increased markedly in number and complexity, but he does not yet grasp the social implications of his behavior.

When he goes to school this relatively self-centered individual encounters a world vastly different from that to which he has been accustomed. He may have been partially prepared for this transition by attending nursery school or kindergarten, but despite this he has

¹⁵ B. Biber, "The Five to Eights and How They Grow." Reprint from *Childhood Education* (69 Bank Street Publications, New York, n.d.), Murphy, Murphy, and Newcomb, *op. cit.*, chap. 10, J. L. Moreno, *Who Shall Survive?* (*A New Approach to the Problem of Human Interrelations*).

many new adjustments to make. He is now expected to conform to a certain established routine, which usually involves the necessity of sitting still for fairly long periods of time. Moreover, he must follow the instructions given by a strange adult, and is expected to do what the other children do. Instead of being the center of attention or a member of a small, familiar group, he must now take his place in a large formal one made up of boys and girls many of whom he may not know. It is little wonder, therefore, that a large part of the child's first year in school is required for his adjustment to this new situation.

The child in the primary grades still is individualistic, and his social activities must be guided and supervised by an adult. The modern school seeks to stimulate social development during this period by providing opportunities for coöperative activities wherein children learn to share and to take turns. The home is often chosen as a center of interest in the first grade, both to teach the child his responsibility to others and to capitalize upon his desire for dramatic play, especially that connected with keeping house.

At this age children are not interested so much in the repetition of an activity as they were in the preschool period, but they like its continuity or succession. This is shown in their dramatization of household activities, where they not only wash clothes but also go through the entire process, hanging them up, sprinkling them, and ironing them. It appears, also, in the stories they like. They want a succession of events, as in "The Little Red Hen," or "Epaminondas."

In addition to playing house they like to play store and doctor, and singing and ring games are popular, such as the Farmer in the Dell, Drop the Handkerchief, London Bridge, and Red Rover.

Children at this age will laugh at anything and often at nothing in particular but just because they hear other children laughing. The grotesque or unusual amuses them, like making "faces," or someone's stumbling, slipping, or falling. They laugh at mispronounced or silly words, and make games out of them. One child may request another to say "cotton," and when he complies, he is told, "You're rotten." This is followed by much giggling, and the game is continued with different words. The language jags and singsongs described in Chapter 6 are further illustrations of this kind of verbal play.

Large constructions appeal to primary children—the kind into

which they can crawl or upon which they can ride. Play apparatus for developing physical and muscular skill is probably more popular at this time than at any later period, as, for example, swings, velocipedes, Junglegyms, rocking boats, slides, etc.

The play groups of six-, seven-, and eight-year-olds have little organization, and children do not feel much social responsibility in this regard. They often withdraw from one group and join another, apparently not realizing that this has any effect on the success of the game. For example, if a child who is playing hide-and-seek with one group tires of it, or is attracted by other children playing tag, he may unceremoniously quit the one group and join the other. Some rules are observed, but at first they are not very strict, and children feel quite free to "tattle" on an offender. They are constantly getting into arguments, too, about choosing sides, and unfair play, and frequently threaten to quit the game if they do not get their own way.

These characteristics are illustrated by the following incident in which a college student was supervising a group of boys who were trying to play football. One of the boys was nine years old, one was eight, and eight were seven years of age.

It took quite a while for play to begin because of numerous arguments about the side on which eight-year-old Tommy was to play. Since he was small for his age and did not play roughly, neither side wanted him. When he was suggested, someone would shout, "I don't want to be on Tom's side," and the others would join in, saying, "Neither do I." Tom's only comment to all this was, "Aw, shut up!"

Finally, at the suggestion of the referee, one side accepted Tommy, and the game started. There wasn't much playing, because the boys would get into an argument after each play, and wanted it settled by the referee. Every time a new boy would arrive, the rest would get into an argument, and new boys were arriving every few minutes!

Some of the boys threatened to quit if "so and so" played. Almost every time a new boy arrived there would be an argument as to which side he should play on, and almost always they would start a new game. They did not care how many were on each side so long as they got on the side they chose. There might be three or four on one side, and possibly six or seven on the other!

Children from six to eight years of age still are eager for adult approval. The girls want grownups to notice and admire a new dress, purse, or shoes, and the boys like to show how high they can jump

or how skillfully they can walk on the edge of a curb or a narrow porch railing. Paradoxically, however, while they actively seek the approval of older people, they are striving, also, to escape from their domination. The beginning of this desire for independence from adults has been noted already, especially between three and three and a half years. At this age the child's attempts at self-assertion are crude and direct. He may refuse point-blank to do as he is told, talk back, accuse the adult of being unfair, use profanity, resort to temper tantrums, destroy something, or exhibit uncouth table manners.

After school entrance children usually develop more subtle ways of showing their independence.¹⁶ They have various methods of "ganging up" on adults, such as excluding them from their confidences. This is facilitated by the use of secret languages, which were discussed in Chapter 6, and by carrying on conversations in whispers, taking great precautions not to be overheard.

In school they frequently irritate the teacher by yelling and chasing each other if she leaves the room. They may mock her behind her back, make unfavorable asides about her when she is not within hearing distance, or draw uncomplimentary pictures of her. By this kind of behavior the child allies himself more closely with his peers and thus liberates himself to some extent from adult domination. Nevertheless, he tries outwardly to cooperate with older people upon whom his security depends. If his parents belong to a certain political party, he will identify himself with it and denounce all others vehemently. In times of crisis or danger, he adopts a common front with grownups against enemies.¹⁷ During World War II, for example, children were indignant about Hitler, Mussolini, and Hirohito, and made various types of verbal threats against them. The following "poem" by an eight-year-old girl illustrates this tendency.

THE WAR

We fight against the rising sun;
The Gurmans fight us, too.
We hate old Hitler, and Mussolini
And Hero Heato, too.

Around the age of eight, most children begin to realize that much of their work, especially in art, crafts, and writing, looks crude and

¹⁶ S. Isaacs, *Social Development in Young Children* (Harcourt, Brace and Company, New York, 1939), pp. 237, 258-264.

¹⁷ Biber, *op. cit.*

unfinished. They want to approach adult standards more closely, make great efforts to be accurate, and constantly seek the teacher's guidance and praise.

Generally, there is not much cleavage between the sexes in play and other group projects until after the age of eight. From then on, as we shall see, there is an increasing tendency for boys and girls to divide into separate groups and to belittle each other's skills and activities. Because younger boys frequently are great admirers and imitators of older ones, however, they may adopt a scornful attitude toward girls earlier than would otherwise be the case.

Experienced teachers feel that nine-year-old children are considerably more mature than they were at the age of eight.¹⁸ A year seems to make a great deal of difference. This is evidenced by the nine-year-old's broadened outlook on life, his increased seriousness, and his improved motor skills. He is now well oriented to school life and usually by this time has established more stable relationships with his peers. The school recognizes the increased maturity of the nine-year-old by providing a more challenging program in the fourth grade. Wider social relationships are introduced in history and geography, and more difficult problems are taught in arithmetic. Sometimes in its desire to capitalize upon this advanced development the school forgets the wide individual differences which exist at this age. Consequently, the child whose growth is proceeding more slowly may be overwhelmed and discouraged.

The noise and activity characteristic of the primary child are typical also of the nine-year-old, and continue until puberty. However, enthusiasm for running and chasing games is being replaced by competitive activities. Fairly large groups of children participate in these, and there is a distinct desire to excel in order to gain social approval. The loose organization which was so evident in the primary grades is disappearing, and a better team spirit is developing. Although there is still considerable bickering over rules, most of the participants want to abide by them. There is greater stability in the groups, and social pressure prevents the casual withdrawing which was so common heretofore. If a child quits a group because his companions refuse to play the game he desires, he is either ridiculed or ignored.

¹⁸ E. S. Reece, "An Interesting Age to Teach" Reprint from *Progressive Education*, April, 1939.

Children now can organize their own groups generally without adult supervision. Popularity and leadership among them seem to depend mostly upon overt behavior, that is, upon what individuals do, rather than what they refrain from doing. For example, in choosing friends and leaders, fourth-grade children in Texas preferred those who were daring, aggressive, and friendly.¹⁹

If a grownup is in charge, the success of the group depends largely upon his leadership. The importance of good adult leadership is shown in the club activities of 10-year-old boys.²⁰ In so far as possible, three types of leadership were employed, designated as (1) "authoritarian," (2) "laissez-faire," and (3) "democratic."

In the first, or authoritarian type, the leader determined the policies and gave explicit directions about what was to be done. In the laissez-faire group the leader supplied materials, and the boys were left free to do as they wished. He was to supply information when requested but was not to participate actively in the group. Under democratic guidance the group was to decide all policies with the encouragement and help of the leader.

The effects of these three types of leadership upon the boys were quite marked. In the authoritarian group, where 256 orders were given in six meetings, the boys became either submissive or aggressive. They tended to work as individuals rather than as an organized unit, and showed little self-confidence or interest. They applied themselves intensively when the leader was present, but when he left the room they ceased work and became aggressive and irritable. There was much more dissatisfaction in this group, also, than in either of the others. Under laissez-faire leadership the boys accomplished very little; there was a great deal of confusion, "horseplay," and discontentment. A feeling of friendliness, better morale, and unity prevailed under democratic leadership. The boys showed greater pride in their work, reached a higher level of accomplishment, and expressed less discontent than did those in the other groups. The authors' own experience with Boy and Girl Scout troops and similar organizations is in agreement with the above findings.

In addition to organized activities where personal desires are sub-

¹⁹ M. E. Bonney, "Personality Traits of Socially Successful and Socially Unsuccessful Children," *Journal of Educational Psychology*, 1943, 34.449-472.

²⁰ R. Lippitt and R. K. White, "The 'Social Climate' of Children's Groups," in R. G. Barker, J. S. Kounin, and H. F. Wright (eds.), *Child Behavior and Development*, chap. 28.

ordinated to group goals, certain other kinds of individual play and recreation are engaged in by both girls and boys between the ages of 9 and 12. Girls, for example, spend a great deal of time jumping rope. This may be attempted by five- and six-year-olds, but the peak occurs between 8½ and 13 years, after which there is a noticeable decline.²¹ Jumping rope is enjoyed for its rhythm and spontaneity, and also because it is relatively free from adult control. Repeating the rhymes which accompany rope jumping adds to its zest and social value. Although some of these persist from generation to generation, new ones arise, or old ones are adapted to modern conditions. These rhymes are a further illustration of children's interest in language play, and the two given below are typical.

Grandmother, Grandmother, I feel sick.
Send for the doctor, quick, quick, quick.
Doctor, Doctor, shall I die?
Yes, my darling, by and by.
How many pills shall I take?
One-two-three-four, etc.²²

Mary ate some marmalade,
Mary drank some beer,
Mary ate some other things
That made her feel so queer.

Ooops came the marmalade,
Ooo-oops came the beer;
Ooo-ps came the other things
That made her feel so queer.²³

Boys and girls in the middle grades like other outdoor activities also, such as skating, swimming, bicycling, picnicking, hiking, and camping. Besides active sports like baseball, football, and basketball, boys enjoy acrobatic stunts, relays, track, and similar forms of recreation. Sedentary activities among boys are concerned largely with

²¹ S. H. Britt and M. M. Balcone, "Jumping-Rope Rhymes and the Social Psychology of Play," *Journal of Genetic Psychology*, 1941, 58:289-306. (Excerpts reprinted by courtesy of Dr. Carl Murchison, Treasurer, The Journal Press, 2 Commercial Street, Provincetown, Mass., publishers of the *Journal of Genetic Psychology*.)

²² *Ibid.*, p. 296.

²³ *Ibid.*, p. 295.

experimentation and construction. These include erector sets, mecanos, electrical apparatus, and chemistry outfits. Interest in dolls is declining among girls, and they are beginning to turn to drawing, cooking, sewing, and designing. Both sexes enjoy table games, picture puzzles, and card tricks. Reading, listening to the radio, and going to the movies also are popular at this time and are such important influences that they will be discussed in detail in a later chapter.

The kinds of hobbies which are being cultivated around the end of this period are well illustrated by an extensive survey which was made on 2342 boys and 2437 girls enrolled in the sixth grade in 31 different states.²⁴ A definite relationship was shown between the child's intelligence and the kind of hobby he pursued. Boys who make collections and like to read rate higher in intelligence than those who have no hobbies or whose interests are in active games, sports, and driving a car. Girls who play musical instruments and read as a hobby are superior to those who engage in housework or religious activity. The principal hobbies for girls and boys ranked both in relation to intelligence and according to frequency of occurrence are:²⁵

| Boys | Girls |
|--|---|
| 1. Collecting | 1. Playing musical instruments |
| 2. Reading history, science, and biography | 2. Collecting |
| 3. Playing musical instruments | 3. Scouting or serious club activity |
| 4. Traveling | 4. Reading, history, science, biography, and the like |
| 5. Reading novels | 5. Social clubs, dancing, etc. |
| 6. Participating in dramatic activity | 6. Driving a car |
| 7. Participating in religious activity | |

It will be noted that sex differences are apparent in the foregoing list of hobbies as well as in the other play activities which we have mentioned. As we saw, both sexes mingle together freely between the ages of four and eight. In the preadolescent years, from approx-

²⁴ P. L. Boynton, "The Relationship Between Children's Tested Intelligence and Their Hobby Participations," *Journal of Genetic Psychology*, 1941, 58:353-362.

²⁵ *Ibid.*, p. 360. (Reprinted by courtesy of Dr. Carl Murchison, Treasurer, The Journal Press, Provincetown, Mass.)

imately 8 to 13, however, a cleavage between the sexes develops.²⁶ This is often referred to as the "gang" age, and is one of the most critical stages in social growth. The duration of this period, obviously, varies from one individual to another, depending both upon the rate of maturation and upon environmental conditions.

One writer insists that when boys and girls become contemptuous of each other and regard mingling with the opposite sex as an indication of weakness on the part of a boy or a girl, we can be sure we are dealing with preadolescents.²⁷ This is the time when boys form casual, random groups whose aims vary with their passing interests. They require loyalty and democracy of their members and in return offer the boys a certain sympathy and understanding. However, without guidance and with the individual's identity merged in the group, the gang may lead to the mob spirit and consequently to some forms of delinquency. As one writer so aptly expresses it: "The gang is not a superficial phenomenon, like having the measles or learning decimals. It is a psychological attitude which affects the boy's whole personality. It is a period of profound change which finds the boy as an individual and leaves him a member of a social whole. The boy learns civics from his teacher, but democracy from his gang."²⁸

Gangs generally are not so common among girls, but they may organize small social clubs or societies. Although preadolescent girls claim that they have no interest in the opposite sex, they usually spend most of their time at group meetings discussing boys. There is a tendency at this time, also, for both boys and girls to single out a chum with whom they can exchange confidences or silly secrets.

Clubs should be encouraged for both sexes, because they are more deliberate and purposeful in their aims and are better organized than are informal groups. Examples of organizations having high ideals and constructive purposes are Boy and Girl Scouts, "Y.M." or "Y.W.," school hobby clubs, and church societies. Although scouting is one of the most effective agencies for character building and social development at all ages from seven upward, it is particularly helpful during the preadolescent period.

²⁶ Moreno, *op. cit.*, p. 60.

²⁷ P. H. Furfey, *The Gang Age*, p. 4.

²⁸ *Ibid.* Copyright 1926 by The Macmillan Company. Used by permission of The Macmillan Company, publishers.

Parents who do not understand sex cleavages sometimes try to arrange parties and other social events where preadolescent boys and girls are brought together. The usual outcome of such attempts is that each sex separates and engages in independent activities.

Gang behavior represents a further stage of the child's identification with his peers, and another step toward securing freedom from adult control. Heretofore, his standards have been largely those of adults, but now the codes accepted by his peers become the rules by which he is guided. Frequently these peer codes are in conflict with the kind of behavior expected by adults.²⁹ Parents, for instance, encourage high marks and are pleased when teachers approve of their children's achievement and manners. According to the peer code, however, too much studying makes a boy a "sissy," and the teacher's approval makes him a "pet."

Many children adjust to the transition from adult to peer codes without much difficulty, while others experience serious emotional conflicts. They are torn between loyalty to their companions and desire to please their parents, and sometimes go to extremes in either direction.

If parents and teachers understood clearly this shift which is taking place in the youngster's standards, they might be less disturbed over his behavior during these years. It is important for adults to know when they should enforce their codes upon the child and when they should not interfere with his activities. There is no doubt, however, that life with the preadolescent often is trying.³⁰ His rejection of what grownups consider to be good manners, his constant eating, his boisterous behavior, his lack of consideration for others, and the freedom with which he criticizes everyone and everything are characteristics which adults find difficult to overlook. It should be remembered, however, that these represent a kind of "growing pains," which accompany normal progress toward social maturity.

ADOLESCENCE AND YOUTH

In tracing the social development of the school-age child, we have noted considerable progress during this period. The youngster has

²⁹ F. Redl, "Pre-Adolescents—What Makes Them Tick?" Reprinted from *Child Study* (A Journal of Parent Education), Child Study Association of America, 221 W. 57th Street, New York 19, N.Y.

³⁰ *Ibid.*

learned to cooperate with larger groups and to adjust to school routine. With increasing maturity he becomes less individualistic and learns to subordinate his own desires in order to carry out group goals. This is shown, especially, by his preference for more highly organized competitive games. He is much better able to choose and direct his own activities, and can select his own leaders. Adult supervision still is important, but the child is continuing to liberate himself from the domination of grownups. This is evidenced particularly in the preadolescent years, when peer codes have more weight in regulating conduct than do those of adults. Loyalty to his age mates and to the kinds of behavior which they sanction is of the utmost importance to the preadolescent, even though he may wish, also, to please both his parents and his teachers.

The arrival of sexual maturity brings a new and significant factor into the process of social growth. Before puberty, boys and girls voluntarily segregate themselves, and their social organizations are unisexual. Now, however, in adolescence, interest in the opposite sex appears, and one of the chief developmental tasks of this period is to find one's appropriate sex role in a heterosexual society.³¹

This is not an easy problem for the boy or girl, and it is complicated further by the wide age range at which puberty occurs. It will be recalled from Chapter 4 that there may be as much as an eight- or nine-year age range in the onset of sexual maturation and that, in general, girls are about two years ahead of boys in this respect. It was pointed out, also, that both personal and social maladjustments may accompany unusually early or late maturation, and that the more rapid physical development of girls results in their being more socially mature than boys of the same age.

It is practically impossible, therefore, to regard adolescence as a fixed age period. Nevertheless, the majority of boys reach puberty between 13 and 15, while girls mature between 11 and 13. Although our consideration of adolescent social development will include most individuals at these ages, we must bear in mind constantly that there are many exceptions. Such deviations in themselves constitute an added problem in social adjustment, and the greater they are, the more serious this problem becomes.

One of the most interesting social phenomena of early adolescence

³¹ C. M. Tryon, "The Adolescent Peer Culture," in N. B. Henry (ed.), *Adolescence*, chap. 12.

is the transition from the unisexual "gang" to the heterosexual "crowd." Like many characteristics of this period, the crowd represents somewhat of a regression. It is more loosely organized than the gang, and has no definitely expressed goals.³² Unlike the gang, the crowd contains both boys and girls, preferably, but not necessarily, in equal numbers. There is no "pairing off," however, until later adolescence. Membership in a crowd may vary anywhere from a few to 15 or 20. From an adult point of view the most baffling feature of this social group, probably, is its apparent aimlessness. Occasionally the crowd goes to a party, picnic, or dance, but most of its time seems to be spent merely "fooling around." The crowd occupies the porch or living room of one or another of its members, and monopolizes a local drug store or sweet shop. Sometimes these boys and girls spend an afternoon in a music store listening to records and playing the piano. This seemingly purposeless activity has, in reality, an important function in adolescent social development. It is the exploratory phase of adjustment to members of the opposite sex, providing an opportunity for boys and girls to learn to know each other and to discover the nature of their mature sex roles. Their seemingly inane chatter gives them the necessary practice in developing conversation, and their group association helps them to learn the social grace and etiquette of adult society.

By the late teens, the nature of the crowd has changed somewhat. It now tends to be made up exclusively of couples who are "going steady." It may be smaller than the earlier crowd, and its members usually engage in more definitely planned types of social activities. At this stage, it is considered very important to pair the right boy with the right girl at any social function. Any member of the group who is planning a party spends a great deal of time making sure that the right couples are invited.

Besides these larger adolescent crowds, smaller groups or "cliques" often develop during the high school and college years.³³ These may include both boys and girls, but they are restricted more commonly to members of the same sex. In this respect they are, in a sense, the persistence of the preadolescent unisexual gang.

Several factors probably contribute to the formation of cliques. Early or late maturers may associate together, because they find it

³² L. Cole, *Psychology of Adolescence*, chap. 7

³³ *Ibid*

difficult to adjust to the majority who have reached puberty within the normal age range. Those with superior intelligence or with special abilities, also, may find the company of others with similar interests more congenial. Perhaps the most important reason for clique formation, however, is the social snobbishness which begins to appear during the adolescent years. In childhood and even in early adolescence children are not keenly aware of differences in social and economic status. They choose their associates primarily for the individual qualities which they possess, and are relatively uninfluenced by social class, wealth, or family tradition. In the middle and late teens, however, they become increasingly aware of these factors, largely because of the emphasis placed upon them by their parents. They are told that certain boys and girls are "undesirable" or "not your class," and are urged to cultivate the acquaintance of those whose families are socially prominent. This is particularly true among people of the upper lower or lower middle classes of society who are trying to rise in the social scale.³⁴ They believe that one of the best ways of accomplishing this is to have their children associate with those who are secure in higher-class status.

During the high school years, also, there is a much greater emphasis upon clothes, and activities requiring liberal allowances. Because of this, the boys or girls whose parents cannot afford to give them these things are unable to compete socially with wealthier companions. They are, therefore, excluded from cliques where money is an essential factor, and either may be socially isolated or may ally themselves with lower-class groups with whom they can have freer social intercourse. Nevertheless, as was mentioned in the preceding chapter, such social discrimination may have serious effects upon the individual's personal and social adjustment.

These adolescent cliques form the basis for the secret clubs and societies of the high school and the fraternities and sororities of college. In such organizations the common interests and social attitudes of the members are fostered by elaborate initiation rituals, and group loyalty is strengthened by emphasizing secrecy. Curiously enough, the ritual usually involves a rough initiation followed by a very solemn pledging service. In American colleges rough initiations vary from group to group, but usually include a lot of "horseplay" and

³⁴ A. Davis, "Socialization and Adolescent Personality," in N. B. Henry (ed.), *op. cit.*, chap. 11.

dressings up in ridiculous ways. The pledging service commonly consists of a candlelight ceremony in which officers clad in appropriate robes administer solemn-sounding oaths to the awed neophytes.³⁵ In most instances, also, new members are reminded tactfully of their financial obligations!

Although secret organizations are discouraged in high schools, they have become an accepted part of college life. In 1940 it was estimated that there were 262 different sororities and fraternities in the United States.³⁶ Secret organizations, of course, are not restricted to adolescents and youths. They are an integral part of adult American society, and are an important agency for the preservation and transmission of group standards and traditions.³⁷ College fraternities and sororities have been criticized for being undemocratic, fostering snobbishness, and promoting ill will between groups. Most colleges and universities try to regulate the practices and behavior of these organizations. Nevertheless, the failure of a sensitive student "to make" a certain fraternity or sorority may be considered a social tragedy by the individual involved. On the other hand, the student who does belong to one of these groups often has an opportunity to acquire social poise and self-confidence, which are assets in adult society.

There are numerous campus organizations open to the student who does or does not join a fraternity or sorority. These include dramatic clubs, glee clubs, debating societies, journalistic activities, and religious and social service groups. These provide many of the same opportunities for social participation as are offered by the more exclusive organizations, and generally are more democratic.

As contrasted with the preadolescent, who rather prides himself upon being unkempt, personal appearance and grooming are important in the adolescent's socialization.³⁸ This is true especially with the girls, who spend a great deal of time upon hairdos, make-up, and fancy manicures. They place a high premium upon "being in style," both as to clothes and accessories. During early and middle adoles-

³⁵ For an interesting account of fraternities and sororities, read S. H. Britt, *Social Psychology of Modern Life*, chap. 19.

³⁶ Consult A. E. Duerr (ed.), *Baird's Manual, American College Fraternities* (The Collegiate Press, George Banta Publishing Company, Menasha, Wis., 14th ed., 1940).

³⁷ Britt, *op. cit.*

³⁸ Tryon, *op. cit.*

cence, also, there is considerable social pressure toward conformity in dress and appearance. Even so, there is individual expression in hair styles and in the use of costume jewelry. After each girl finds a mode of dress and make-up which she considers becoming, however, she tends to habituate herself to them, and turns her attention to other interests.

It has been said facetiously that the surest sign of sex-consciousness in a boy is when he begins paying attention to whether his neck and ears are clean and wondering if his hair is properly combed. As with the girls, there is pressure toward conformity in dress. Certain kinds and colors of sports shirts, jackets, and raincoats are worn by the group, and the boy is unfortunate, indeed, who cannot dress in the prescribed manner.

Many parents fail to realize the importance of this phase of their children's social development, and often are appalled by their fantastic and outlandish appearance. From an adult standpoint, garments are to be judged by their quality and price rather than by whether or not they happen to be "what others are wearing." This emphasis upon personal grooming, as a factor in social acceptance, continues into adulthood. As a matter of fact, our American society stresses personal appearance more than does any other culture.

The friendships of early childhood are, for the most part, highly volatile. In the prepubescent and early adolescent years, however, as we have noted, there is a tendency for individuals to select a special friend or chum of the same sex with whom confidences are exchanged. In later adolescence and youth, of course, friendships with members of the opposite sex are developed. In the normal course of events these heterosexual friendships are narrowed down until they culminate in the selection of a mate and the establishment of a home.

Adolescent friendships are somewhat unstable but may be more lasting than is commonly believed. Comprehensive studies were made of the friendship fluctuations of 905 rural and 969 urban boys and girls in grades 6 to 12, ranging approximately from 10 to 18 years of age.³⁹ The technique employed was to ask the subjects to list the names of their three best friends in order of preference. This

³⁹ J. E. Horrocks and G. G. Thompson, "A Study of the Friendship Fluctuations of Rural Boys and Girls," *Journal of Genetic Psychology*, 1946, 69:189-198; also Thompson and Horrocks, "A Study of the Friendship Fluctuations of Urban Boys and Girls," *Journal of Genetic Psychology*, 1947, 70:53-63.

was repeated after a two-week interval, and the lists were then compared. Results indicated that friendships tended to become more stable with increasing age for both urban and rural groups. Urban boys and girls, however, showed a slightly greater degree of stability than did those from rural areas. While there were no reliable sex differences, friendships among girls fluctuated less. There were, of course, wide individual differences within each sex.

Many factors are involved in the choice of friends at different periods of growth. Living in the same neighborhood or being in the same nursery group largely determines the friendships of preschool children. Propinquity is an important factor in the choice of friends among school-age children, and some sex differences appear at this time, too. Because of the value which they place upon physical status, boys tend to select friends of the same size, whereas girls are influenced more by similarity in scholarship.⁴⁰ With adolescent girls, however, traits other than intellectual ones influence the selection of friends. They tend to choose girls of similar age and of a similar degree of dominance and sociability.⁴¹ Among college students the traits most desired in friends are those that promote congenial face-to-face contacts. The four traits most desired by men and women in their own and in the opposite sex are:⁴²

Traits Men Desire in Men

Intelligence
Cheerfulness
Friendliness
Congeniality of interests

Traits Men Desire in Women

Beauty
Intelligence
Cheerfulness
Congeniality of interests

Traits Women Desire in Women

Intelligence
Helpfulness
Loyalty
Generosity

Traits Women Desire in Men

Intelligence
Consideration
Kindliness
Cheerfulness

Questionnaire results from 200 Jewish college men and women indicated that loyalty is rated highest by both sexes, and that oversen-

⁴⁰ C. N. Winslow and M. N. Frankel, "A Questionnaire Study of the Traits That Adults Consider to Be Important in the Formation of Friendships with Members of Their Own Sex," *Journal of Social Psychology*, 1941., 13:37-49.

⁴¹ V. Van Dine, "Personality Traits and Friendship Formation in Adolescent Girls," *Journal of Social Psychology*, 1940, 12.291-303.

sitiveness, garrulity, and bragging about sex conquests are disliked most.⁴³

Humor is one of the most highly prized social qualities. It has been defined as "the sudden perception of a contrast between things as they are and things as they ought to be or are thought to or are expected to be."⁴⁴ Everyone likes to be considered humorous, and there is a widespread belief that a sense of humor is a mark of intellectual superiority. Many theories have been advanced to explain humor and laughter,⁴⁵ but none of these is entirely satisfactory. Contrary to common opinion, humor is difficult to measure⁴⁶ because it varies so much with age, sex, the situation in which it occurs; its method of presentation, i. e., whether visual or oral, and how familiar the individual is with the humorous circumstance.

Nevertheless, a number of studies have been made at different ages, which have furnished the basis for several conclusions about its nature and development. A large proportion of humorous situations may be classified according to one or more of three categories:⁴⁷ (1) derisive, (2) sympathetic, and (3) whimsical. Derisive humor has a "sting" to it, and gives the individual a feeling of superiority at another's expense. In sympathetic humor the person is amused at the misfortune of someone else. He feels mildly sorry for the other person but is relieved that the incident did not happen to him. The perception of subtle incongruities is the basis of whimsical humor. In this type of situation attention is focused upon the illogical nature of the circumstances. Surprise or sudden release from tension are important elements, also, in humor-provoking situations.

Earlier in this chapter we called attention to the development of smiling and laughter in young children. We saw that laughter in preschool children is called forth by slapstick situations, involving primarily physical incongruities. Studies have revealed, also, that surprise and superiority are fundamental elements in the humor of kindergarten children.⁴⁸ In addition to these, the child between 7 and 10 laughs at incongruities and at the abasement of dignity.⁴⁹ A sur-

⁴³ *Ibid.*

⁴⁴ Britt, *op cit*, p. 270.

⁴⁵ *Ibid.*, pp. 265-268

⁴⁶ R. B. Cattell and L. B. Luborsky, "Personality Factors in Response to Humor," *Journal of Abnormal and Social Psychology*, 1947, 42:402-421.

⁴⁷ Britt, *op cit*, p. 263

⁴⁸ Murphy, Murphy, and Newcomb, *op. cit.*, p. 825.

⁴⁹ *Ibid.*

vey of humor among boys and girls in the seventh, ninth, and twelfth grades⁵⁰ indicated that they preferred jokes containing elements of absurdity, slapstick, satire, and whimsy. With older high school students there is a decrease in absurdity and slapstick. Boys seem to have a better sense of humor than do girls, but no relationship was found between intelligence and sense of humor. Among high school students visual rather than oral presentation of jokes is preferred.⁵¹ Humorous incidents which appealed most to girls at Vassar College were concerned more with superiority than with incongruity.⁵² Other college women,⁵³ when asked what things made them laugh, named play on words, vulgarity, and sex in addition to practically all the humor elements which have been mentioned.

It seems evident, then, that humor changes with age, but that many of the elements which appeal to younger children persist into the high school and college years. Perhaps one of the most significant changes that occurs with increasing age is the transition from the more concrete and obvious types of situations to those which are more subtle and abstract. Sex differences apparently exist, but a sense of humor does not necessarily indicate superior intelligence.

As might be expected, play and recreational activities undergo a definite change during adolescence and youth. High school boys still are interested in competitive athletic games and sports, but there is an increasing tendency for them to become spectators of contests between expert teams, rather than to participate in such activities.⁵⁴ This is in sharp contrast to the preadolescent boy, whose main desire is to play football or baseball regardless of the degree of skill which he possesses. With older boys, however, the importance of being a good player is much greater, and those who cannot "make the team" usually sit on the side lines and watch the others.

Physical education programs in most high schools and colleges contribute to this situation by devoting most of their attention, as well as a large proportion of available funds, to the production of a

⁵⁰ Quoted from a study made by Ruth Wells. See L. Omwake, "Factors Influencing the Sense of Humor," *Journal of Social Psychology*, 1939, 10 95-104.

⁵¹ Omwake, "Humor in the Making," *Journal of Social Psychology*, 1942, 15:265-279.

⁵² Omwake, "Factors Influencing the Sense of Humor," *Journal of Social Psychology*, 1939, 10:95-104.

⁵³ Murphy, Murphy, and Newcomb, *op. cit.*

⁵⁴ H. S. Dimock, *Rediscovering the Adolescent*, p. 14.

"winning team." Little, if any, effort is directed toward developing intramural sports and physical activities in which all can engage. This is recognized as one of the major problems in American secondary and higher education. A few school systems and colleges are attempting to meet the situation by putting more emphasis upon sports, like golf and tennis, which can serve as recreation in adult life. A few institutions⁵⁵ have been courageous enough to withdraw from intercollegiate athletics, and to devote their resources exclusively to promoting physical education for *all* students. For the most part, however, intensive physical training still is given to a minority of athletes who do not need it, while the requirements of the majority are neglected.

Adolescent girls show an even greater decline in their participation in active games, and a pronounced trend toward more sedentary forms of recreation. This may be accounted for partly by the fact that our culture assigns a more passive sex role to women, although it may result, to some extent, from the physical changes accompanying puberty. Girls, also, become spectators,⁵⁶ and spend a great deal of time watching the athletic contests of boys. Physical education programs for high school girls and college women generally provide opportunities for playing basketball, volleyball, and similar games, and also for such activities as swimming and archery. Folk dancing and relay games frequently are included, too, but there is still considerable emphasis upon gymnastics. Many of these games and activities, however, are engaged in because they are required, and not necessarily because they are liked.

Data collected on 8200 junior and senior high school students in Philadelphia⁵⁷ showed an increase of nearly 400 percent between the seventh and twelfth grades in requests to be excused from gymnasium classes. This increase was confined almost solely to the girls and was believed to be due primarily to lack of interest rather than to genuine physical disability. The author points out that the physiological changes which occur during adolescence probably reinforce the girls' disinclination for physical exercise. It is the socialization of interests, however, which seems to be the major factor in this situa-

⁵⁵ Like the University of Chicago.

⁵⁶ H. C. Lehman and P. A. Witty, *The Psychology of Play Activities*.

⁵⁷ F. H. Lund, "Adolescent Motivation Sex Differences," *Journal of Genetic Psychology*, 1944, 64:99-103.

tion. For instance, girls' gymnasium teachers agreed that the underlying reasons for girls' seeking to be excused from classes were: physical disinclination, concern over disturbing make-up and hairdo, fear of developing big muscles, and unwillingness to change into gym clothes.

In high school and college, swimming, skating, and tennis are popular forms of recreation for both boys and girls. Social dancing, however, probably is engaged in most widely by young people of both sexes. Being a good dancer is a great social asset, and more attention should be given to the development of skill in dancing. Bridge and other card games are played a great deal, and there is increasing interest in commercial amusements, like the radio, movies, and night clubs. Reading magazines and light fiction is a popular pastime during these years, and we shall have more to say about this in a later chapter.

WHAT ARE SOCIOMETRIC TECHNIQUES?

The importance of peer relationships during childhood and adolescence has been mentioned repeatedly in this chapter. If adults are to be helpful in promoting the adjustment of individuals to their age mates, they should understand some of the fundamental principles of group structure and dynamics.

Experienced teachers and observant parents usually can tell, from watching children and adolescents playing and working together, which individuals are popular and which ones are unpopular. Some are always the first to be chosen, whereas others either are left until the last, are overlooked, or are rejected altogether.

Since the 1930's, simple methods have been devised for studying systematically various types of interrelationships within groups. Such methods are referred to as sociometric techniques or devices. One of the better known of these was devised by Moreno⁵⁸ to ascertain the associates with whom an individual wished to live, work, and go to school in an institution for delinquents, organized according to the cottage system.

The individual usually is asked to name in order of preference the three people whom he likes best, or who are the most popular. In a school situation he may be requested to name those with whom he would like to work on a project or serve on a committee. After these

⁵⁸ Moreno, *op. cit.*, p. 11.

choices are made, the resulting interrelationships are plotted on a chart or sociogram, similar to those in Figures 63 and 64. Pictures of girls and boys are seldom used, however, the former usually being represented by circles, and the latter by squares. Special terms are employed to describe certain kinds of interrelationships,⁵⁹ and some of these will be explained in order to make the charts more meaningful.

If two individuals choose each other, they are known as "mutual choices or pairs." Those who are not selected by anyone in the group, and who do not choose anyone, are called "isolates." "Islands" is the name given to pairs or small groups of mutual choices not selected by any in the large group.⁶⁰

Figure 63 represents a sociogram of sixth-grade children in the elementary school directed by Hunter College.⁶¹ It will be seen that the four most popular children are Eunice, Ruth, Dannie, and Ernie. Al is an isolate who wanted to sit beside the teacher. Bianca, Norma, and Janet constitute an island or triangle, who agreed to choose each

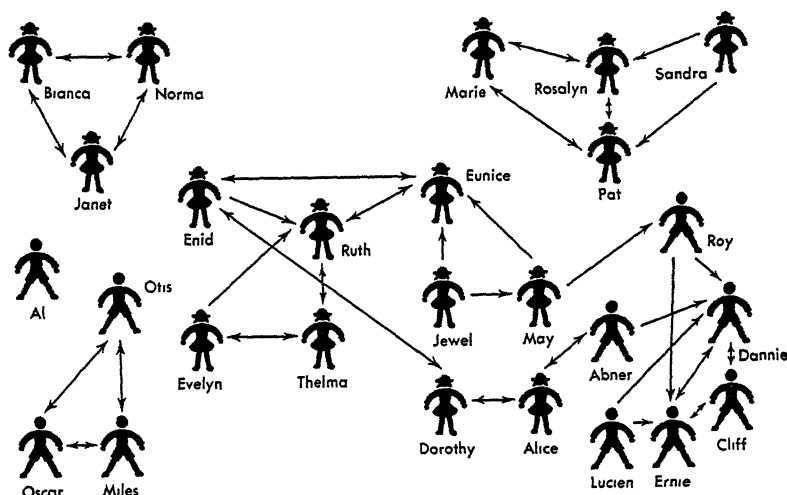


FIG 63. Sociometric Chart Showing the Social Interrelationships of Sixth-Grade Children in an Elementary School Directed by Hunter College (Reprinted from February, 1945, *Coronet* Copyright, 1945, by Esquire, Inc.)

⁵⁹ *Ibid*, pp 104-105

⁶⁰ Consult *How to Construct a Sociogram* by the Horace Mann-Lincoln Institute of School Experimentation.

⁶¹ L. Aigner, "Teaching the ABC's of Happiness," *Coronet*, 1945, 17.77-81.

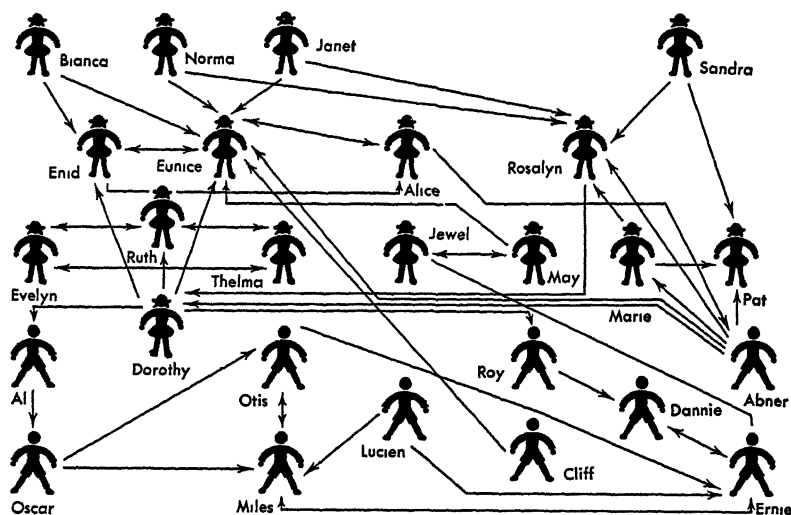


FIG. 64. Sociometric Chart of the Same Sixth Grade Shown in Fig. 63 Six Months Later. (Reprinted from February, 1945, *Coronet*. Copyright, 1945, by Esquire, Inc.)

other so as to avoid the stigma of being isolates. A boy triangle, Otis, Oscar, and Miles, appears in the lower left-hand corner of the chart. The two triangles and the quartet in the upper right-hand corner are "islands," also. Jewel selected May and Eunice, but was not chosen by anyone.

Figure 64 shows that the group has become more cohesive after six months of careful adult guidance. Although Al's social relations improved, he was still unhappy. He had been accelerated from a group in which he had been popular, and was finally returned to it. By calling attention indirectly to the attractive qualities possessed by children in the "islands," the teacher was able to get them accepted by the larger group. Jewel, who was chosen by no one at first, became happier by having at least one friend, May.

The validity of sociograms, obviously, depends upon the honesty and morale of the group. Experience shows, too, that they work best with individuals over nine years of age.⁶² Those who wish to use this method will find the step-by-step procedure outlined in a pamphlet published by the Horace Mann-Lincoln Institute of School Experimentation extremely helpful.

⁶² See *How to Construct a Sociogram*.

Charting a group in this manner enables the teacher or leader to recognize individuals who need help in socialization. Opportunities can then be provided for learning and living situations which will promote better social adjustment.

Another device which is helpful in finding out the social attitudes within a group is the so-called "social distance scale." Designed originally to measure how closely a person would be willing to ally himself with other races,⁶³ this scale has been adapted to measure social distance in the classroom.

The technique consists in asking each member of the class to check the other members according to the following degrees of social intimacy:⁶⁴

1. Would like to have him as one of my best friends.
2. Would like to have him in my group but not as a close friend.
3. Would like to be with him once in a while but not often or for long at a time.
4. Don't mind his being in our room but I don't want to have anything to do with him
5. Wish he weren't in our room.

Results for each individual can be shown graphically by a series of concentric circles, with himself at the center.⁶⁵ His best friends would appear in the circle nearest him, his acquaintances farther out; and those with whom he does not wish to associate at all would be in the outermost circle. This technique can be employed not only in the classroom but in other types of social groups as well. If combined with the sociogram, it should yield a fairly complete analysis of the social interrelationships existing within any group.

A different method of appraising social growth has been employed in the Vineland Social Maturity scale.⁶⁶ It includes 117 items arranged in order of increasing difficulty from the first year of life through age 25. Growth is shown in "self-help, self-direction, loco-

⁶³ For a reproduction of the original Bogardus method, read Murphy, Murphy, and Newcomb, *op cit*, pp 898-900.

⁶⁴ Reproduced from *How to Construct a Sociogram*, p 30.

⁶⁵ See J. R. Runner, "Social Distance in Adolescent Relationships," *American Journal of Sociology*, 1937, 43:428-439

⁶⁶ E. A. Doll, *The Vineland Social Maturity Scale* (The Training School, Vineland, New Jersey, 1936). An interesting illustrated report was also written by Dr. Doll entitled *Your Child Grows Up* (John Hancock Mutual Life Insurance Company, Boston, 1939).

phases of social development not measured by the scale which continue beyond these ages. Contrary to common opinion, college students are not less mature socially than are other groups. In fact, they are more mature than CCC enrollees or unemployed youth. They appear to be slightly less mature than are employed youth, but the difference is not significant statistically. Since the data were gathered mostly from students of the University of Nebraska and from others residing in that state, there is some question as to whether the results are applicable to *all* sections of the country. Nevertheless, the scale is useful in providing an objective estimate of social maturity at the various levels which it covers.

HOW ARE PLAY AND RECREATION RELATED TO SOCIAL BEHAVIOR?

In our discussion of social development we have shown that play and recreation are bound up intimately with the process of socialization. Not only is the individual's social growth influenced by play, but his play activity is affected, also, by his socialization. The factors which influence play, then, are of great significance in relation to social development in general and merit more detailed consideration.

We must not forget, however, that play is valuable as a means of furthering *all* aspects of development.⁷⁰ Certain play activities are an aid to the individual's general physical condition and muscular coordination, and also stimulate his self-activity and freedom. Others are a valuable means of self-expression and furnish insight into his various adjustments. One writer summarizes the play of childhood thus: "To the child play is life itself, serious, all-absorbing, self-validating. By it he lives and grows. Through it he develops his own personality and his ability to get along successfully in society."⁷¹ The recreational activities and hobbies of adolescence and youth, obviously, serve the same general purposes.

We have seen already that play changes with age and that certain types of activities tend to be characteristic of certain developmental levels. Nevertheless, there is great overlapping from age to age, and no one kind of play is confined exclusively to any single age group.

⁷⁰ Read *Play: A Child's Way of Growing Up* (A Teacher's Guide to Children's Play Interests), by C. Lambert (Play Schools Association, Inc., 119 W. 57th Street, New York 19, N.Y., 1947).

⁷¹ J. E. Rogers, *The Child and Play* (Appleton-Century-Crofts, Inc., New York, 1932), p. 12

This overlapping is accentuated by the wide individual differences in rate of maturation which we have noted so frequently.

We have called attention, also, to the sex differences which are observable both in play behavior and in recreational interests. Here again, the earlier maturation of girls is an important factor, especially with regard to social activities. Cultural pressure, too, probably contributes greatly to these sex differences. Besides age and sex there are a number of other factors which affect play development. Of these we shall discuss intelligence, emotional stability, economic status, rural or urban environment, season of the year, and type of neighborhood.

Play equipment and proper facilities for recreation are of vital importance. Standards for these, together with lists of materials suitable for various ages, therefore, will be included.

SOME FACTORS INFLUENCING PLAY⁷²

Intelligence

Children of subnormal intelligence usually choose younger companions, because their play interests are immature and they can "boss" younger children. Conversely, bright children usually select older playmates, whom they find more congenial because their interests are more mature.

Extensive studies made upon bright children⁷³ show that they participate in more play activities than do children of average intelligence. They select more social but fewer humorous games, enjoy activities which require thinking, and are mildly social and quiet. They engage in more solitary play, and read far more extensively than do normal children. They also show less preference for competitive games than do average children. Those who are subnormal, unless they play with younger companions, tend to stand around and watch others. They show no originality or leadership and, if urged to participate in group games, play only those which are exceedingly simple. These characteristics of the play of children of different intellectual capacities tend to be true, also, of adolescents and young people. As mentioned earlier in this chapter, intelligence is related

⁷² Consult Lehman and Witty, *op. cit.*, chaps. 5, 7, 8, 9, 12, 14.

⁷³ L. M. Terman et al., *Genetic Studies of Genius* (Stanford University Press, Stanford, Calif., 2nd ed., 1926), Vol. I, pp. 437-439.

to the nature and number of an individual's hobbies and to other types of leisure-time activities.

Emotional Stability

Although it is commonly believed that emotional stability has a definite influence upon play interests, this assumption has not been confirmed by experimental investigations. A comprehensive study⁷⁴ was made of the play interests of 938 girls and 862 boys enrolled in the middle grades of certain public schools in Tennessee and Kentucky. The subjects also were given a test of emotional stability in order to determine what, if any, relationship existed between this and their play activities. Results were largely negative, i.e., the child's emotionality had no relationship to the kinds of play or recreation in which he or she engaged. It had no effect, either, upon the breadth of play interests.

Economic Status

Using the same subjects,⁷⁵ an attempt was made to determine the extent of the relationship between play preferences and economic status. Each individual's economic background was judged according to certain specific criteria, such as number of occupants in relation to number of rooms in the house, the absence of various kinds of modern household appliances, etc. Although economic status affected likes or dislikes for a few play activities, there was no general relationship between it and play preferences. In general, too, the range of play activities was not curtailed by limited economic background. These conclusions, however, are at variance with the results of earlier studies made upon preschool children.⁷⁶ In an earlier section it was pointed out, also, that both social and economic factors exert an increasing influence upon both the interests and the recreational activities of girls and boys after adolescence.

Rural or Urban Environment

Between the ages of 8½ and 10½ rural boys⁷⁷ engage in fewer play activities than do city boys, but after that period they participate in

⁷⁴ P. L. Boynton and J. D. Wang, "Relationship Between Children's Play Interests and Their Emotional Stability," *Journal of Genetic Psychology*, 1944, 64:119-127.

⁷⁵ Boynton and Wang, "Relation of the Play Interests of Children to Their Economic Status," *Journal of Genetic Psychology*, 1944, 64:129-138.

⁷⁶ *Ibid.*, p. 138.

⁷⁷ Lehman and Witty, *op. cit.*, chap. 8.

more activities than do city boys. This immaturity in their play has been accounted for by their inability to find enough children of one age to form groups exhibiting homogeneous interests. The same is true of older children as well.

Season of the Year

Even the most casual observer is aware of the influence which changes in the weather and seasons have upon play and recreation. Rainy days bring an emphasis upon reading, indoor games, and sedentary activities, and winter weather encourages ice skating, coasting, making snow men and snow forts, etc. Jumping rope, playing marbles, spinning tops, roller skating, bicycling, hopscotch, chasing and running, and ball games are associated with spring and fall, whereas summer brings swimming, picnics, hikes, and camping.

Type of Neighborhood

It would be difficult to overemphasize the influence which the type of neighborhood has upon an individual's play and recreation. The "only" child, for example, who lives in an area where there are no other children of his age is handicapped in both his play and his social development. In many urban areas, too, there is little available play space, and children must carry on their activities in streets, alleys, or other undesirable places. An effort is being made to remedy this situation by establishing parks and playgrounds under trained supervision, but these are still too few in most cities. Camps for underprivileged children have been established in many parts of the United States and aid somewhat in providing healthful and constructive activities at least for a brief period during the summer months. Recreation centers catering especially to teen-agers were popular during the Second World War, and some of these are being continued.

PLAY EQUIPMENT⁷⁸ AND RECREATIONAL FACILITIES⁷⁹

Providing the right types of play materials and suitable play facilities is a serious responsibility. To make an intelligent selection of

⁷⁸ G. M. Whipple (ed.), *Preschool and Parental Education. The Twenty-Eighth Yearbook of the National Society for the Study of Education* (Public School Publishing Company, Bloomington, Ill., 1929), Parts I and II, pp. 693-704; M. F. Nimkoff, *The Child* (J. B. Lippincott Company, Philadelphia, 1934), pp. 187-191; C. G. Garrison, *Permanent Play Materials for Young Children* (Charles Scribner's Sons, New York, 1926).

⁷⁹ See publications of National Recreation Association, 315 Fourth Avenue, New York 10, N.Y.

toys one must know what values might accrue to the child from their use and one must be guided by certain well-established standards or criteria, so that he is not misled by adult preferences or by "surface appeal."

The following standards are suggested for evaluating permanent play equipment:

1. Toys or play apparatus should be durable and well built. They should permit rough usage. In the long run they are safer and more economical than the flimsy ones which must be replaced frequently. As examples, we might mention sandboxes, swings, blocks, wagons, skates, dolls, dishes.

2. Toys should be suitable to the child's physical development. For the small child large toys are preferred because they do not produce muscular strain. Large building blocks are a splendid illustration of this principle. Small mosaics or sewing apparatus, which employ tiny pieces of material or do not provide contrast, should be avoided.

3. Toys should be washable, safe, and sanitary, especially when used over a long period of time or by many different children. Balls, blocks, dolls, carts, etc., are examples. Toys with sharp edges or decorated with cheap, poisonous paint should not be handled by small children.

4. Toys should be beautiful as well as useful. They should have good proportion, line, and color. Examples. Doll clothes, doll furniture, etc.

5. Toys should lend themselves to a variety of uses. They should stimulate invention and ingenuity. Blocks are a good illustration. They can be piled up in carts and dumped, and they can be used to construct wagons, stores, garages, etc. A Junglegym is a splendid piece of climbing apparatus and also stimulates dramatic and social play.

6. Toys should be provided for both solitary and social play. There are occasions when children need to play alone and there are many instances where social play is vital. Drawing materials, books, and dolls encourage solitary play, while swings, velocipedes, table games, etc., are good for social activities. The child should learn to take turns, not to expect to win every time, to share, and to defend himself.

7. Children should have toys for both outdoor and indoor play. The former should develop the child's motor coordination, encourage freedom and self-activity. The latter may stimulate solitary or social, dramatic or creative play.

8. Too many toys may cause the child to be destructive and unappreciative. If he is oversupplied, it is desirable to put some away for future use.

9. Toys should be appropriate to the child's age, mental development, and needs. Unless they fit in with the child's ability and interests they will

tend to bore or confuse him rather than to challenge him to activity or invention. For example, a doll carriage is not a very satisfactory plaything to the baby unable to walk, and a mechanical toy may fascinate a father but bore his four-year-old son.

In urban areas neighborhood playgrounds, playfields, indoor recreation centers, etc., are an essential means for providing adequate recreational facilities for all ages. Comprehensive standards for these have been formulated by the National Recreation Association. In general "to yield a maximum return, recreation areas and facilities must be properly located; adequate in size; developed for diversified use; well maintained; operated by capable leaders; and related to the city's master plan."⁸⁰

Playgrounds and playfields are especially important for the first two decades of life. The former, for those between 6 and 15 years of age, should make provision for: "sand and water play, games of many kinds; apparatus play; story telling; rhythm bands; making things; nature activities; treasure hunts; folk dancing; and tournaments of all kinds."⁸¹ The latter, designed primarily for older children and young people, should offer opportunities for baseball, football, and the like; tennis, croquet, golf; picnicking; swimming; day-camping, etc. Recreation buildings should feature a gymnasium, an auditorium, a social room, a game room, an arts and crafts workshop, and an indoor swimming pool.⁸²

LISTS OF PLAY MATERIALS AND ACTIVITIES

Various authors⁸³ have furnished lists of toys and play equipment suitable for children of different ages. Some of these are of much practical value and three of the most useful lists follow. It should be remembered, however, that toys may be used for different reasons at different ages and periods of development. The intelligence and in-

⁸⁰ *Standards* (Playgrounds, Playfields, Recreation Buildings, Indoor Recreation Facilities) (National Recreation Association, n.d.), p. 3.

⁸¹ *Ibid.*, p. 4.

⁸² *Ibid.*, pp 7, 9.

⁸³ H. C. Washburne, "The Right Toy for the Right Age," *Child Welfare*, The National Parent-Teacher Magazine, December, 1930, pp 198-204 (write to 1201 16th St., N W, Washington, D.C.); D. Van Alstyne, *Play Behavior and Choice of Play Materials of Pre-School Children* (University of Chicago Press, Chicago, 1932), especially Table 28, p 90; R. H. Alschuler, *Two to Six: Suggestions for Parents of Young Children* (William Morrow and Company, New York, 1933), pp. 114-115; also M. J. Barthlow, "Contributions of Blocks and Block Activity in the Development of the Young Child" (unpublished M.A. thesis, Ohio State University, Columbus, 1936).

terests of the individual must also be considered when making selections.

TOYS SUITABLE FOR BABYHOOD⁸⁴

(Ready-made toys)

(Home-made toys)

1 to 3 months

Rattles, strings of beads, celluloid and rubber rings, small animals of rubber or celluloid.

Spools, strings of buttons, light spoons. Chains made by linking large safety pins together.

3 to 6 months

Floating celluloid toys for the bath. Bells.

Small lids and covers. A cup and spoon. Clothespins. Rattles made of aluminum salt shakers, tea-balls, etc., with small pebbles inside. Sheets of clean crisp paper.

6 to 9 months

Light wooden blocks. Dolls. Toy animals. Picture books.

Various kitchen utensils—egg-beater, potato masher, wooden butter-paddle, etc. Hard fruits and vegetables of different shapes, such as oranges, cucumbers, small gourds and squashes.

9 to 12 months

Nests of hollow blocks or boxes. Blocks. Books to use in turning pages as well as to look at. Balls. All sorts of manipulative toys—an abacus, small games of quoits, etc.

Sets of pans, cups, cans, boxes, etc., which will fit one inside another. Jars, bottles, etc., with removable lids to take off and put on. Boxes or baskets containing a number of small objects which may be taken in and out. Handfuls of old post-cards, etc.

12 to 15 months

Primers with simple stories. Toys to drag or pull about—a small wagon or wheelbarrow, a bell mounted on wheels, toy animals set on wheels, etc. (Such toys

A cylindrical can or carton impaled on a string or wire so that it will roll as it is dragged about is often even better than toys with wheels at this stage, because it

⁸⁴ From J. C. Fenton, *A Practical Psychology of Babyhood*. (By permission of the publishers, the Houghton Mifflin Company, Boston. Copyright, 1925)

TOYS SUITABLE FOR BABYHOOD—(*Continued*)*12 to 15 months*

should be solid and not too easily tipped over. A two-wheeled cart or wheelbarrow is better than a four-wheeled one, because it is less liable to upset in turning corners.) Toy replicas of household articles—iron, broom, shovel, doll's furniture, etc. Toy chair to sit on.

turns in any direction readily without upsetting. Pebbles, a bell, or something of the sort, may be put inside to make a noise. Empty boxes and cartons.

15 to 18 months

Toy trains, autos, etc. More miniature household articles. Crayons and pencils to mark with, toy blackboards, slates, etc.

A box to climb upon. (An apple box is of a good size to climb into and out of. Care should be taken that there are no nails, splinters, etc.) A plank raised at one or both ends to walk on and bounce on.

18 to 24 months

A sand pile. Bucket and shovel, shells, various toys for digging, etc. Toys which enable the child to reenact his own real experiences, such as toy airships, farm implements, trains, doll carriages—whatever he has encountered and enjoyed in real life. A swing. More elaborate blocks.

Scrapbooks, made by pasting pictures cut from magazines, etc., in blank books or books made of heavy butcher's paper. Blocks made of leftover lumber, etc.

PLAY MATERIALS FOR CHILDREN FROM TWO TO EIGHT YEARS⁸⁵

(Active Play and Physical Development)

(Dramatic and Imaginative Play)

(Creative and Constructive Play)

Two-Year-Olds

*Large hollow blocks

*Doll-corner materials

*Clay or plasticine

*Good-sized wagon

*Easel

⁸⁵ From R. H. Alschuler and C. Heimig, *Play. The Child's Response to Life*, Vol. II of *Childhood. The Beginning Years and Beyond*. (By permission of the publishers, the Houghton Mifflin Company. Copyright, 1936.)

* Indicates the most popular materials.

PLAY MATERIALS FOR CHILDREN FROM TWO TO EIGHT YEARS—(*Continued*)*Two-Year-Olds*

- | | | |
|---------------------------------|----------------------------------|---------------------|
| *Blocks that Lox | *Unbreakable and washable dolls | *Painting materials |
| *Balls | | Blunt scissors |
| Push and pull toys | *Household materials | Large wooden beads |
| Small metal airplanes and autos | *Small wooden and cuddly animals | Large crayons |
| | Noah's Arks | Rings on pegs |

Three-Year-Olds

- | | | |
|------------------------|----------------------------|----------------------------|
| *Assorted blocks | *Doll-corner materials | *Plasticine or clay |
| *Large hollow blocks | | *Easel paints |
| *Big wagon | *Household materials | Scissors (blunt) and paste |
| *Push and pull toys | Dolls and doll accessories | Colored cubes |
| Parallel bars | Animals | Large crayons |
| Hammer and nail sets | | Large wooden beads |
| Balls | | Large peg boards |
| Junior indoor gym sets | | Rings on pegs |

Four-Year-Olds

- | | | |
|----------------------|-------------------------|--------------------------------|
| *Assorted blocks | *Doll-corner | *Clay |
| *Push and pull toys | *Household (laundry) | *Painting materials |
| *Balls and bean bags | Animals and farmyards | Scissors |
| *Dump trucks | Costumes (Indian, etc.) | Large wooden beads |
| Hollow blocks | Telephones | Crayons |
| Workbench and tools | | Colored cubes |
| Balls and balloons | | Simple puzzles |
| Wheelbarrow | | Hammer and nails |
| | | Soft wood |
| | | Paper (newspaper and wrapping) |

Five-Year-Olds

- | | | |
|----------------------|----------------------------------|--------------------|
| *Assorted blocks | *Doll corner | *Crayons and paper |
| *Balls and bean bags | *Costumes (cowboy, Indian, etc.) | *Clay |
| *Push and pull toys | | *Blunt scissors |
| Hollow blocks | | Colored cubes |
| Carpenter's bench | *House play | Simple puzzles |

PLAY MATERIALS FOR CHILDREN FROM TWO TO EIGHT YEARS—(*Continued*)*Five-Year-Olds*

| | | |
|-------------|-------------|------------------------------|
| Tools | Play screen | Large wooden beads |
| Wheelbarrow | Telephone | Easel, etc. |
| | | Scrapbooks |
| | | Simple paper dolls |
| | | Materials for dressing dolls |
| | | Knitting spool |
| | | Simple cut-outs |

Six- and Seven-Year-Old Girls

| | | |
|---|-----------------------------------|------------------------------|
| Construction blocks | *Dolls and doll accessories | Blackboard |
| Gym equipment (bars, rings, etc.) | *Large doll house and furnishings | Cardboard house and villages |
| Games (anagrams, parchesi, lotto, dominoes, checkers, travel games, parlor croquet, etc.) | *Kitchen equipment | *Cut-outs, furniture, dolls |
| | *Playhouse | Desk |
| | *Costumes | Doll clothes (making) |
| | Playstore equipment | Easel, paint, brushes |
| | | Paper dolls |
| | | Puzzle maps |
| | | Sewing, etc., outfits |
| | | Soapbubbles, etc. |
| | | Weaving looms |

Six- and Seven-Year-Old Boys

| | | | |
|-----------------------|------------------------------------|--------------------|-----------|
| *Trains (electric) | Aviator, Indian and other costumes | Airplanes | } To make |
| *Boats, toy and model | Playstores | Autos | |
| *Airplanes | | Boats | |
| *Balls | | Kites | |
| *Marbles | | Blackboard | |
| Construction sets | | Cardboard houses | |
| Dump trucks | | Cardboard villages | |
| | | Carpenter's tools | |
| | | Design blocks | |
| | | Easels, etc. | |
| | | Puzzle maps | |

PLAY MATERIALS FOR CHILDREN FROM EIGHT TO THIRTEEN⁸⁶

| (Active Play and Physical Development) | (Dramatic and Imaginative Play) | (Creative and Constructive Play) |
|--|---------------------------------|----------------------------------|
|--|---------------------------------|----------------------------------|

Eight- and Nine-Year-Old Boys

| | | |
|--|---------------------------|--------------------------------------|
| Bicycles | Trains | Airplane and other constructive sets |
| Baseball equipment | Airplanes (model and toy) | Arkitoy building lumber |
| Steering sled | Buddy L. fire engine | Tool chest |
| Scooter | Buddy L. tractor | Workbench |
| Boxing gloves | Dump truck | |
| Apparatus (rings, swings, trapeze, etc.) | Steam roller | |
| Football equipment | Boats (toy and model) | |
| Archery | Soldiers | |
| Ice skates | Costumes | |
| Ball-bearing roller skates | | |
| Snow skates | | |
| Marbles | | |
| Skis | | |

Eight- and Nine-Year-Old Girls

| | | |
|--------------------------------------|--------------------------|---------------|
| Bicycles | Dolls | Art sets |
| Balls (beach, soccer, water, basket) | Doll accessories | Crayons |
| Sleds | Playhouses and furniture | Box of paints |
| Scooter | Kitchen equipment | Printing book |
| Wagon | Small electric stove | Cut-outs |
| Ice skates | Cabinet | Glitter wax |
| Roller skates | Iron | Artascope |
| Apparatus (same as boys) | Electric trains and cars | Sewing sets |
| Boxing gloves | Costumes | Weaving sets |
| Junglegym | | Blackboards |
| | | Desks |

Ten- to Thirteen-Year-Old Boys

| | | |
|--------------------|------------------------|-------------------|
| Bicycles | Trains and accessories | Construction sets |
| Baseball equipment | Trucks | Meccano |
| Bat | Dump trucks | Erector |
| Ball | Derrick | Airplane |
| Gloves | Cement mixer | Bild-al |
| Football equipment | | Architectural |

⁸⁶ Adapted from Washburne, *op. cit.*, pp. 201-203.

PLAY MATERIALS FOR CHILDREN FROM EIGHT TO THIRTEEN—(*Continued*)*Ten- to Thirteen-Year-Old Boys*

| | | |
|---------------------------------|--------------|------------|
| Steering sled | Wrecker | Tool chest |
| Ice skates | Steam roller | Workbench |
| Basketballs | Sprinkler | Jig saw |
| Tennis racquet | Soldiers | Lathe |
| Skis | | Easel |
| Hockey stick | | Crayons |
| Archery equipment | | Paints |
| Boxing gloves | | |
| Indoor gym equipment | | |
| Junglegym | | |
| Balls (water, beach, soccer) | | |
| Tops | | |
| Marbles | | |

Ten- to Twelve-Year-Old Girls

| | | |
|----------------|-------------------|--------------------|
| Bicycles | Dolls | Blackboard |
| Ice skates | Doll accessories | Paints |
| Balls | Dollhouse | Crayons |
| Tennis racquet | Kitchen equipment | Painting books |
| Baseball | | Glitter wax |
| Gym | | Clay modeling |
| Roller skates | | Paper doll |
| Jumping rope | | Weaving loom |
| | | Basket weaving set |
| | | Sewing box |
| | | Sewing machine |
| | | Typewriter |

SUMMARY

The process of socialization is long and tedious, and constitutes one of the major developmental tasks faced by everyone. In our complex modern society every individual must learn to live, work, and play with others.

At birth the baby has no perception of his relations to others. He acquires it slowly through the handling and care he receives.

Crying and smiling usually are of no social significance before the third month of life.

Between three months and the end of the first year other social responses appear, such as kicking, cooing, and laughing aloud; exploring features of familiar faces; shaking the head; repeating simple sounds; playing with his mirror image; and pat-a-cake. Most of the child's early play consists in acquiring sense impressions and motor experiences.

After he can walk, however, there is greater variety in his play behavior. From 15 to 18 months there is absorbed interest in adults and children, generally followed by a period of negativism, representing the child's first attempts to become independent of adults.

During the preschool years laughing tends to increase and crying decreases. At school entrance children laugh at situations of a slapstick nature.

The interest of one child in another develops very slowly from the point at which they are scarcely aware of each other to the stage where there are mutual efforts to attract attention.

Imitation soon becomes an important factor. Imaginary companions occur particularly with "only" children and may persist secretly to the age of 10.

Before school age children play in small groups, and sex differences are not apparent in their social activities. Aggressive behavior increases during the preschool period, and boys employ physical techniques, whereas girls use verbal methods.

The case of G. B. illustrates some of the outstanding stages in social development during the preschool years.

School entrance constitutes a major problem in social adjustment for the average child, and a large part of his first year in school is devoted to this task.

Because of his individualistic tendencies, the social activities of the child in the primary grades require adult supervision. Dramatic play, and singing and ring games are popular at this age.

His humor still is predominantly physical and of a slapstick nature, and there is great interest in verbal play.

His games show little organization, and he does not feel much social responsibility for the group.

Although children seek adult approval, they are trying, also, to free themselves from adult domination. Their methods for gaining independence, however, are much more subtle than those used in earlier years.

As compared with primary children, those in the middle grades seem to have a more mature outlook on life. Games at this period are noisy and active, and competition is keen. Groups are better organized, although much bickering still persists.

The type of adult leadership which groups have at this age is a vital factor in determining their social behavior.

The nature and number of hobbies are important, also.

Both sexes mingle together freely between the ages of four and eight, but a cleavage develops between 8 and 13 years. This is the period when gang activity predominates, especially in boys. Peer standards now guide the child's behavior and are more important to him than are those of adults. This represents the beginning of the final stage of social "weaning," and frequently is a difficult period for both adults and children.

The arrival of sexual maturity brings a new and significant factor into the process of social growth. Interest in the opposite sex appears, and an important developmental task is to find one's appropriate sex role. One means to this is the heterosexual "crowd" of early adolescence. It provides an opportunity for boys and girls to learn to know each other, and their group association helps them to learn social graces and amenities.

By the late teens, the crowd is made up exclusively of couples who are "going steady."

Smaller groups or "cliques" often develop during the high school and college years and form the nucleus of secret societies, fraternities, and sororities. Many other organizations are open to those who do not become members of secret groups.

Adolescence brings an awakening of interest in personal appearance and clothes, and much time is spent upon grooming, especially by girls.

The tendency to have special chums of the same sex, which began in preadolescence, continues throughout adolescence and youth. Adolescent friendships are somewhat unstable, but are more lasting than is commonly believed.

Humor changes with age, but many elements which appeal to younger children persist into the high school and college years. With increasing age there is a transition from the more concrete and obvious types of situations to those which are more subtle and abstract.

Sex differences exist, but a sense of humor does not necessarily indicate superior intelligence

During adolescence and youth there is a tendency for individuals to become spectators of, rather than participants in, competitive games. This is more pronounced among girls.

Physical education programs in the more progressive high schools and colleges are endeavoring to secure greater participation among both sexes in a wider variety of activities.

Simple methods have been devised for studying systematically various types of interrelationships within groups. Among these are the Moreno techniques and scales for measuring social distance and social maturity.

Play and recreation are bound up intimately with the process of socialization. They also have significant value in *all* phases of development.

In addition to age and sex, there are other factors which affect play development: intelligence, emotional stability, economic status, rural or urban environment, season of the year, and type of neighborhood.

Play equipment should be durable, safe, sanitary, attractive, and challenging, and should aid physical development and motor coordination. It should stimulate activity, originality, and social adjustment and should be appropriate to the interests and maturity of the child. An abundance of toys is not desirable, and the most elaborate and expensive playthings are not necessarily the most suitable. Numerous lists of play materials have been compiled and serve as useful guides, but in the long run the nature and needs of the individual must be the determining factors in their selection. In urban areas, neighborhood playgrounds, playfields, and indoor recreation centers are an essential means for providing adequate recreational facilities for all ages.

Socialization is a fundamental aspect of personality development. There are, however, other phases of the nature and growth of personality which we shall discuss in the following chapter.

SUGGESTED ACTIVITIES

1. If possible, observe a child less than a year old and report to the class instances of both nonsocial and social smiling and crying. Be sure to note the exact age at which these occur.

2. Ask each member of the class to hand in an anonymous report on the imaginary playmates he or she may have had during childhood. The report should include the sex of the contributor; a description of the imaginary companion, the age when he or she first appeared; and the length of time the phenomenon persisted.
3. If possible, visit a nursery school or kindergarten, observe and report to the class instances of the kinds of social behavior described in your text.
4. Arrange to visit a Sunday School class, scout troop, or play group in a public school, where the children range between 7 and 12 years. Note and report on the type of leadership and its effect on the group. Keep a record of any controversies which arise during the observation, and discuss the methods used in handling them.
5. Tell the class about any instance of which you may know where pre-adolescent boys and girls refused to mingle with each other at a party.
6. Report anonymously on the nature and activities of the adolescent "crowd" to which you belong, or of one which you may now know intimately.
7. Appoint a committee to gather and summarize anonymous accounts from your class on the good and bad features of sororities and fraternities.
8. Have each member of the class keep a diary for one week of the situations provoking laughter. Compare these with the Omwake studies cited in this chapter.
9. Appoint one or two members of your class to obtain permission to visit some room above the fourth grade in a public school and secure the information necessary for making a sociometric chart. Construct this as a class project and discuss the results.
10. If you live in a city or town, secure the standards for recreational facilities for urban areas compiled by the National Recreation Association and rate your home community.

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HOW PERSONALITY DEVELOPS

The term "personality" is used a great deal, and is especially popular at the present time. Everyone seems to be interested in the improvement of personality, and numerous books on the subject have appeared. Despite this widespread interest, the concept of personality is one of the most difficult to define adequately. Many people think of it as a sort of entity or thing distinct from an individual's other traits and tendencies.

We know, however, that personality is an organic whole or unit resulting from the integration of all one's characteristics. Thus, in outlining development during the first two decades, we consider separately such aspects as general physical and motor development; the acquisition of language; the growth of intelligent behavior, learning; emotions; social development; and the growth of special interests and creative activities. We have shown already, and shall see further, that all these phases of growth follow a general pattern, although there are marked individual differences.

When we deal with personality, however, we must try to think of it not merely as the sum of different growth processes but rather as a qualitative whole which depends both upon the combining of separate traits and upon the way in which they are organized. For example, a musical selection is not just a haphazard collection of notes. It is the arrangement of notes into a particular pattern, and the combinations and variations of tones, which produce the harmonious whole. Personality, then, may be defined as "the complete and unified outcome of all the developmental processes through which an

individual has passed,"¹ or all the individual's traits and tendencies functioning as an integrated whole. Actually, as we have said, personality is not an entity, but rather a convenient abstraction used to describe the unique way in which an individual's various traits are functionally related.

HOW WE STUDY PERSONALITY

The foregoing conception of personality, obviously, is a broad one and merits further discussion. It is not a product of armchair thinking but has evolved from experimental studies which had their inception around the beginning of the present century. The descriptions and classifications of personality made by the ancients and by the philosophers and psychologists of succeeding centuries have been of a speculative nature, and it was not until 1906 that the first statistical study² of personality was attempted. Very little real progress in this field occurred, however, prior to 1920. Since 1939, Gestalt psychology, with its emphasis upon the study of the individual as a whole, has been making the greatest contribution to our knowledge of personality.³

In general, two approaches to the study of personality have been employed. One seeks to understand it by analyzing it into its fundamental traits or factors; the other emphasizes the totality of the personality pattern.

In the first type of approach the individual may be designated as robust, energetic, intellectual, expansive, moody, irritable, dominant, persistent, self-confident, overcritical, sociable, friendly, extroverted, etc., or by any of the other 17,953 terms⁴ used to describe personality! Obviously, so large a list of terms implies the existence of much overlapping, and emphasizes the need for determining and clarifying the number and definitions of fundamental personality traits.

Various methods have been used to find out how many and what

¹ C. H. Judd, *Educational Psychology* (Houghton Mifflin Company, Boston, 1939), p. 447.

² G. C. Schwesinger, *Heredity and Environment: Studies in the Genesis of Psychological Characteristics* (The Macmillan Company, New York, 1933), p. 90.

³ H. Sargent, "Projective Methods. Their Origins, Theory, and Application in Personality Research," *Psychological Bulletin*, 1945, 42:257-293

⁴ Quoted from Allport and Odbert by N. L. Munn, *Psychological Development: An Introduction to Genetic Psychology* (Houghton Mifflin Company, Boston, 1938), chap. 15

traits make up personality. By the rather complicated statistical technique of factor analysis, discussed already in the chapter on intelligent behavior, psychologists are trying to ascertain the number of these traits, which ones are independent, and which ones seem to hang together as clusters.

The work of Dr. R. B. Cattell is probably the most extensive and ambitious undertaking made to date to determine the fundamental dimensions of personality through factor analysis.⁵ His present list of 12 traits is admittedly temporary, and is based on analyses of data secured from cross-sectional studies. These will be supplemented later by material gathered from longitudinal investigations

In contrast to the first point of view, the second approach stresses the necessity of studying the individual's personality in relation to his background and experiences. The importance of separate traits is recognized, but such traits take on meaning only in their relationship to the personality as a total pattern. Moreover, since the individual is a reflection of his experiences, and these are constantly changing, the concept of personality is a dynamic one, involving continuous adjustment and reintegration.

This dynamic pattern follows a rather broad developmental sequence from early childhood to maturity. As we shall see, certain characteristics are much more constant than others, but in general there is a steady growth of personality as a whole with the widening of experience. Nevertheless, the kind of situations which an individual encounters at different growth levels will have a great effect upon his developing personality. The social background from which he comes, and the kinds of behavior which are approved or disapproved by those around him, will exert a profound influence upon him. Nor should it be thought that the dynamic nature of personality ceases with maturity. Changes may be less evident than they were in the earlier years, but the individual still must meet new problems constantly and adjust to them. In fact, it has been suggested⁶ that the effectiveness of adult personality can be judged best by the way in which one habitually meets new situations.

⁵ R. B. Cattell, *Description and Measurement of Personality* (World Book Company, Yonkers, 1946); read, also, G. W. Allport, *Personality: A Psychological Interpretation*, chap. 9.

⁶ R. H. Seashore and W. Jensen, "Personality Classification," *Scientific Monthly*, 1948, 66:472-474.

HOW PERSONALITY GROWS

ARE WE BORN WITH A PERSONALITY?

According to the definition which we have given, it can hardly be said that the newborn infant has a recognizable personality, but evidently he possesses the raw materials from which his personality will be developed. We have noted already that the neonate's behavior repertoire is extremely limited, and that his awareness of and response to objects and people around him are vague and diffused. Nevertheless, it is claimed that such simple reactions as crying, smiling, and laughing are different in different babies,⁷ and that these characteristic ways of responding make it possible to identify individuals even from birth. Some investigators believe that this early "core" of personality persists into later childhood and may continue throughout life.

In Shirley's longitudinal study of 25 infants,⁸ it was shown that personality differences are apparent at birth and that the underlying personality patterns do not change. However, as age advances, some patterns *are* replaced by others. Thus, her findings indicated that Sibyl and Judy had high speech records throughout the first four years, whereas James, Martin, Quentin, Torey, and Maurice were low until the fourth year, when great improvement was noted. Shirley concluded that "talkative babies became talkative children and the quiet babies became silent children."⁹ The smallest amount of change was concerned with general development and locomotor and manipulatory traits. Social factors were the least constant, and language factors occupied an intermediate position.

Neilon¹⁰ made a follow-up study of these same children 16 years later. In standardized interviews with the mother she tried to ascertain the attitudes, interests, and activities of each child concerned.

⁷ C W Brackett, "Laughing and Crying of Preschool Children," *Child Development Monograph*, No 14 (Bureau of Publications, Teachers College, Columbia University, New York, 1934)

⁸ M. M Shirley, *The First Two Years*, Vol III

⁹ *Ibid*, p. 119.

¹⁰ P. Neilon, "A Personality Follow-Up of Shirley's Twenty-Five Babies" (an unpublished M.A. thesis, University of Minnesota, 1946), as quoted by J. E. Anderson in "Personality Organization in Children," *American Psychologist*, 1948, 9:409-416, and "Shirley's Babies After Fifteen Years: A Personality Study," *Journal of Genetic Psychology*, 1948, 73:175-186.

This procedure was supplemented further by having both parents rate the children on a wide variety of traits. Without consulting Shirley's data, Miss Neilon made thumbnail sketches of these children and later compared them with the originals. After a lapse of 16 years they showed a large amount of constancy in their personality traits.

Gesell says that "certain fundamental traits of individuality, whatever their origin, exist early, persist late and assert themselves under varying environmental conditions"¹¹ He discusses, also, an experiment made at the Yale clinic on the constancy of personality traits. From an analysis of cinema records covering the first year of life, a trained worker rated five different children on each of 15 different behavior traits. At the age of five another appraisal was made, and the results were compared with the first ratings. Although the five personalities were still in the making, "a significant degree of internal consistency in the behavior features of these children at one year and at five years of age" was found. This constancy is attributed to "a biological characteristicness which lies at the core of human individuality."¹² Thus, an awkward child remains awkward; an inquisitive child is still inquisitive; and a gay child is still gay at one and at five years.

As Shirley pointed out, some aspects of personality are more constant than others. We should naturally expect characteristics closely associated with biological structure to change less than those which are more influenced by experience. There is, of course, an integral relationship between the two, but one may exert more weight in the determination of traits than the other. Physique, for example, is largely the product of family stock and may, therefore, be relatively constant. Its significance for personality, however, depends greatly upon the way in which it is interpreted both by the individual and by others in his environment. We must be careful, too, about labeling an individual on the basis of a single, outstanding trait. Are we justified, for instance, in characterizing a child as "inquisitive" or "gay" when he may possess many other traits also, which are not included in these terms? Nevertheless, it may be said that such dimen-

¹¹ A. Gesell, "Early Evidences of Individuality in the Human Infant," *Scientific Monthly*, 1937, 47:225.

¹² A. Gesell, C. S. Amatruda, B. M. Castner, and H. Thompson, *Biographies of Child Development* (Paul B. Hoeber, Inc., Medical Book Department, Harper & Brothers, New York, 1939), p. 307

sions of personality as intelligence, emotions, and physiological and motor abilities are more constant than are social relationships.

Despite the work of Shirley and others, it is difficult to think of a newborn infant as having a distinct personality! It seems more reasonable rather to reserve the term "personality" until the child is clearly aware of his connection with specific objects and experiences which he refers to as "I," "me," or "mine," and until he exhibits consistency of behavior which becomes characteristic of him in dealing with certain people, things, and situations¹³ Native equipment may affect this process, and it varies considerably with different children, but it is recognizable in most of them by three or four years of age. When a child reaches this point he certainly can be said to have a personality, even though it is far from being completely developed.

HOW THE HOME AFFECTS PERSONALITY DEVELOPMENT

Since the family group has greater influence upon personality development than has any other cultural agency, we shall outline some of the ways in which it affects the individual, especially during childhood. The extent to which an adult is accepted socially depends greatly upon the kind of atmosphere which prevailed in his home during his growing years.

In the past there was much theorizing about the social responsibility of the home, but more recently active research has been carried on. Scales have been devised for rating parents, and, in some instances, trained observers have been placed in homes to make direct assessments of interpersonal relationships.

These procedures have been used by the Fels Research Foundation at Antioch College in Ohio¹⁴ in order to ascertain how the behavior and fundamental attitudes of parents are related to the developing personalities of their children. A longitudinal study is being made of 150 children, the oldest of whom was 15 at the time the report was compiled. A trained observer visits each home for a two-hour period twice a year, during which she talks with the mothers and notes the children's behavior in relation to their parents. Two

¹³ Read M. Sherif and H. Cantril, *The Psychology of Ego-Involvements*, chap. 7

¹⁴ A. L. Baldwin, J. Kalthorn, and F. H. Breese, "Patterns of Parent Behavior," *Psychological Monographs*, 1945, 58: No. 3.

reports are made, one a description of what takes place, and the other in the form of a rating scale.

From the data which have been collected, it has been shown that although each home has its own individuality, many homes have enough characteristics in common so that they can be designated by certain patterns. Thus, seven types are listed as follows: "acceptant-democratic, acceptant-democratic-indulgent, acceptant-indulgent; indulgent; autocratic, nonchalant rejectant; and active rejectant." This does not mean that *all* families in the study could be classified according to one or another of these seven categories. In fact, 25 percent did not fit in with any of them. Many of the homes, however, could be characterized as showing different degrees of rejection, indulgence, and democratic behavior on the part of the parents. Graphic and interesting descriptions are given of homes representing different classifications. Of the various types of acceptant behavior exhibited by parents, that which most nearly approached the ideal was thought to be a democratic home where each child is respected as an individual, and the parents show that they are fond of him.

In a good home the child's sense of security is promoted by an atmosphere of affection and mutual respect. He is made to feel that he is a valuable and desired member of the family group, and when matters of importance are discussed, his ideas, no matter how naive, are given consideration. In one family,¹⁵ for example, a council was held concerning choice of pets by two children aged four and six. When asked what pets they would like to have, six-year-old Janet replied, "I'd like a pony and a hen." Teddy, the four-year-old, thought that he would like to have a whale and a Scottie dog. Considerable discussion then ensued between the children as to where they could keep the whale, and Teddy thought they could keep it in the back yard if they had a place with water in it. When they appealed to their father, he told them that a whale could not live in fresh water, even if they could get it there. This seemed to convince Teddy that a whale as a pet was out of the question, and he suggested instead a choice of a lamb or a Scottie dog. The important point in all this is that the parents did not ridicule any of the children's ideas, but accepted and discussed them seriously. Eventually, the children,

¹⁵ H. H. Anderson, *Children in the Family* (Appleton-Century-Crofts, Inc., New York, 1937), pp. 23-26.

Teddy and Janet, without feeling disappointed or humiliated, came around spontaneously to the decision that it was not practical to have a whale for a pet.

In a good home, also, the child's confidences are respected; he is introduced to strange adults as well as to strange children; and his friends are welcomed and made to feel at ease. He is accepted on his own merits and is expected to contribute something to the welfare of the group. This may take the form of helping with the dishes, running errands, or doing certain other household chores. He is taught to respect the rights of others, even when he disagrees with them. The child should be proud of his family and its accomplishments, but he can be so only when it is accepted in the neighborhood. This does not necessarily mean that the family must be wealthy, but its circumstances and conduct must conform to the social and economic class to which it belongs.

Unfortunately, the ideal conditions which we have just described do not always exist. Sometimes there is little *real* affection in the home, and the child may feel unwanted or rejected.¹⁶ At birth, a mother may assume a rejective attitude toward her child, especially if it is illegitimate, and may refuse to nurse it, name it, or even look at it. The effects of such early maternal rejection upon a child's personality development are said to be significant and far-reaching. Because of this, the widespread practice in maternity hospitals of separating mothers from their infants (whether legitimate or illegitimate) is condemned by some writers. It is advocated, instead, that the baby be kept in the same room with the mother, and when this is done, it is claimed that the infant's breathing, feeding, and elimination are improved.¹⁷ In the George Washington University Hospital, for example, plastic bassinets for the newborn are hooked on the side of the mothers' beds. Double rooms with picture windows are provided, also, so that mothers, by sitting up in bed, may view their infants in the nursery.¹⁸ Other writers believe, however, that

¹⁶ F. K. Merry, "Rejected Child," in H. M. Rivlin and H. Schueler (eds.), *Encyclopedia of Modern Education* (The Philosophical Library, New York, 1943), pp. 672-673.

¹⁷ M. A. Rubble, "Infantile Experience in Relation to Personality Development," in J. McV. Hunt (ed.), *Personality and the Behavior Disorders*, Vol. II, chap. 20.

¹⁸ See "Where Are We Now in Maternal and Child Health?" *Childhood Education*, 1948, 25.28.

there has been a tendency to overemphasize the seriousness of the consequences resulting from this temporary separation.¹⁹ The father may reject a child if the mother dies at its birth, or if he has reason to doubt its paternity. Sometimes there is rejection by one or both parents because of economic conditions or marital maladjustments, or because the child's care may interfere with social activities.

Parents are not always fully aware of the rejective attitudes which they have toward their children. Giving a girl a boy's name or using a girl's name for a boy is often an instance of disguised rejection. For example, naming a girl Perseus or calling a boy Shirley may be a reflection of parental disappointment in the sex of the child.

Highly imaginative children sometimes develop feelings of rejection when there is no realistic basis for them.

Whether or not extremely early rejection is as serious as some people believe, there is no doubt but that a consistently rejective attitude by parents and others during the developing years has a marked effect upon a child's personality.²⁰ He may become aggressive and rebellious, and may resort to stealing, lying, and truancy in order to get attention as a substitute for the affection which is denied him. On the other hand, he may become withdrawn and asocial, refusing to enter into normal activities and to cooperate either with other children or with adults.

The attitudes and standards, particularly those of the mother, who plays the dominant role in family life, have a lasting influence, too, upon the child's developing personality.

Buhler²¹ made an interesting investigation of the parent-child relationships in 17 families, including 30 children, living in Vienna. Twelve observers were sent into these family groups to study both the children and the parents. The latter knew that their children were being observed but were unaware of the fact that they, too, were being studied. Each observer took part in the regular family life, eating and playing with the children and helping with the housework. The validity of the findings was based upon the "extent of agreement between the records of different observers."

Each of the families studied emphasized somewhat different sets

¹⁹ See J. E. Anderson, *op cit*

²⁰ P. M. Symonds, *The Psychology of Parent-Child Relationships*.

²¹ C. Buhler, *The Child and His Family* (translated by H. Beaumont) (Harper & Brothers, New York, 1939)

of values. One was child-centered, in another household interests predominated. A third family stressed "order, mutual assistance, and sociability," whereas education was the center of interest in a fourth group. A fifth family showed affection and sociability; in a sixth, these were absent. Despite these differences in standards, *all* families placed great emphasis upon good school marks and acceptable manners. A summary of the observations showed that home instructions concerning practical behavior were given only about one-tenth as frequently as those concerning school work and one-twentieth as frequently as those concerning manners. This overemphasizing of school marks and manners is typical, also, of middle-class American families. It constitutes a major source of friction between parents and children and undoubtedly has permanent effects upon the child's attitudes and behavior.

Another writer²² has pointed out that a child's personality will vary with the mother's attitude toward certain kinds of behavior. With the development of walking and prehension there is an increased desire for manipulation and exploration. This spontaneous activity in the child may be inhibited by some mothers because they fear that he may break something, make a mess, or hurt himself. This is true especially when children are brought up in small apartments, in overcrowded tenements, or where space is limited. In such cases the child may react by being destructive or by doing forbidden things. Some parents are delighted when their children begin to talk, but later may be annoyed by their chatter or boisterousness. Conversely, there are mothers who apparently do not mind noise or dirt but who are greatly upset if the child sucks his thumb or wets his clothes.

In general, children from the lower social classes are less inhibited than are those from the middle classes. Lower-class families are more permissive in their attitudes toward sex (except masturbation); religion; manners; education and school progress; fighting, swearing, and stealing. As a consequence, the child meets fewer frustrating situations, develops a greater sense of freedom and independence, and probably is less tense than the middle-class child.

Rivalry among brothers and sisters is found in most families. In our chapter on emotional development we called attention to the fact

²² L. B. Murphy, "Childhood Experience in Relation to Personality Development," in J. McV. Hunt (ed.), *Personality and the Behavior Disorders*, Vol. II, chap. 21.

that the arrival of a new baby may be a cause of jealousy among siblings if the situation is not handled wisely. If the older child feels that he is being displaced in his parents' affections, he may resort to bizarre or regressive behavior in order to gain attention. On the other hand, if the first child is allowed to "boss" the younger ones, or if he gets an undue proportion of new clothes and privileges, he may feel superior and attempt to dominate the entire family. This attitude may persist throughout life and may color all of his social relationships. Such behavior has an undesirable effect upon brothers and sisters. They seek to compensate for their sense of inferiority by "ganging up" on the older child, and constant bickering and fighting result. Parents may avoid this sort of thing if they will refrain from giving older children too much authority and responsibility. Family budgets should be planned so that each child will experience the joy of having some new clothes occasionally and no one will always be compelled to wear "hand-me-downs." By not making invidious comparisons about physical appearance, intelligence, school success, etc., and by encouraging children to extend their friendships beyond the family circle, parents can avert many occasions for unpleasantness, and more tolerant attitudes can be developed.

Conflicts which arise as the result of being reared in a foreign home are probably less frequent than those brought about by sibling rivalry. When they do occur, however, they may leave an indelible impression upon the personalities of those concerned.²³ The child may be brought up according to "Old World" standards, which are different from those prevailing in American culture, and after he goes to school he may become painfully aware of these differences. Often he feels ashamed of the dress, foreign customs, and broken English prevailing in his home and will not invite children to visit him because he fears their ridicule. He smarts under such names as "Wop," "Dago," or "Hunky," and may become antagonistic and beligerent in order to overcome his feeling of inferiority. He may even resort to joining a delinquent gang to bolster up his ego.

Bilingual freshmen, from a foreign background, attending the American International College were compared with a non-bilingual group on the basis of scores from five types of personality tests.²⁴ As

²³ P. Blanchard, "Adolescent Experience in Relation to Personality and Behavior," in J. McV Hunt (ed.), *Personality and Behavior Disorders*, Vol. II, chap. 22

²⁴ D. T. Spoerl, "Bilinguality and Emotional Adjustment," *Journal of Abnor-*

a whole, the bilinguals held more extreme views on social issues, did not accept members of their own group, felt socially inferior, and experienced more intense family conflicts. It was concluded from this study that, although some of the maladjustments in the bilingual group stemmed from outside social pressures, the major problems arose over the clash between two cultures existing in the same home.

Moving from one section of our country to another, which requires adjustment to various regional social codes, is another important factor in personality development. In the South, for example, certain ethical standards and social virtues valued by "quality folks" are stressed, and these may differ markedly from the values emphasized in the West. In the South, "manners, respect for authority, unselfishness, honor, hospitality, morality, and family background"²⁵ are supremely important, whereas in the West, beauty, wealth, and education are upheld as standards, and the individual is judged on his own merits without relation to his family tree. Southern families, therefore, who move to the western part of the country may experience difficulty in mingling with and being accepted by those native to the region. Such problems in cultural assimilation may be particularly difficult for adolescent boys and girls, to whom social acceptance is so vital a matter.

The desire to become an independent personality or self begins early in life and probably never ceases. As we have seen, the first pronounced attempt to be self-sufficient occurs somewhere between two and a half and three and a half years. The reassertion of this desire for independence may be expressed quite frequently during the growing-up process, and usually is pronounced again at adolescence.

Every normal youth feels the urge to become independent in thought, action, and vocational choice, and his groping for maturity may cause considerable conflict in the family.²⁶ Many of the restrictions imposed by parents are resented and are interpreted as forms of punishment rather than as rules of conduct to which everyone must conform, both for his own good and for the welfare of others.

An interesting questionnaire survey,²⁷ to which reference has been

²⁵ P. H. Landis, *Adolescence and Youth (The Process of Maturing)* (McGraw-Hill Book Company, Inc., New York, 1945), p. 128.

²⁶ L. D. Crow and A. Crow, *Our Teen-Age Boys and Girls* (McGraw-Hill Book Company, Inc., New York, 1945).

²⁷ L. H. Stott, "Adolescents' Dislikes Regarding Parental Behavior, and Their Significance," *Journal of Genetic Psychology*, 1940, 57:393-414. (Behavior items reprinted by courtesy of Dr. Carl Murchison, Treasurer, The Journal Press, Provincetown, Mass.)

made in Chapter 9, was conducted in order to classify the items of parental behavior disliked by adolescents from three different kinds of cultural backgrounds. Those participating were 1878 Nebraska high school students between the ages of 11 and 21 years. Of these 694 came from farm homes; 639 from small towns with populations ranging from 600 to 1300, and the remaining 545 from cities. About two-thirds of these students did not criticize either parent. Of those who were critical of their mother's behavior, 39 percent came from towns; 35.6 percent from farms, and 32.8 percent from cities. Criticisms of the father, especially about personal habits, were voiced by 39 percent of adolescents from towns; 37 percent from farms, and 31.7 percent from cities. In general, girls tended to be more critical of parental behavior than did boys, but the things which they criticized were of a less serious nature. It is interesting to note that the scores on personality tests made by those who criticized their parents were lower than the scores of those who had no criticisms to offer.

The behavior items disliked in parents were classified as follows:

1. Discipline and control
2. Temperamental behavior and traits
3. Personal habits and conduct of the parent
4. Parents' health, emotional adjustment, and control
5. Parental ideas, attitudes, or beliefs
6. Work and self-sacrifice of parents
7. Social maladjustments and activities of parents
8. Trivial matters

The criticism made most often about the mother centered upon discipline and control, and her tendency to overwork and sacrifice herself. In this connection it should be noted that the mother administered 64 percent of all home punishment, the father only 34 percent.

As compared with the trivial criticisms of mothers reported by farm boys, those of the city boys were concerned with more serious traits and difficulties of a temperamental nature. Among these were: "complains, finds fault, inconsiderate," and personal habits, like: "talks too much, smokes, gossips, worries, loses temper, nervous."

A further analysis²⁸ was made of the 75 different reasons given by

²⁸ Stott, "Home Punishment of Adolescents," *Journal of Genetic Psychology*, 1940, 57:415-428. ("Reasons" reprinted by courtesy of Dr Carl Murchison, Treasurer, The Journal Press, Provincetown, Mass.)

650 of the subjects who had reported recent punishment in the home. The following are the principal ones listed according to their frequency:

Getting home late from date
Reason not reported
Disobedience
Nonsensical, trivial things
Being impudent, "sassy"
Neglecting work
Getting home late from school
Being noisy
Quarreling
Fighting

When all three groups are considered, the most frequently assigned cause for punishment was "getting home late from date." For separate groups the percentages are:

| | |
|------------|-------|
| Farm boys | 11.5% |
| Farm girls | 4.4 |
| Town boys | 11.6 |
| Town girls | 11.5 |
| City boys | 11.6 |
| City girls | 16.7 |

"Disobedience" was given as the cause of punishment by:

| | |
|------------|------|
| Farm boys | 9.4% |
| Farm girls | 23.9 |
| Town boys | 11.6 |
| Town girls | 8.4 |

Not one instance of disobedience was cited by urban boys and only 3.3 percent of city girls mentioned it.

The author of these studies believes that variations in culture are responsible for the differences found between farm, small-town, and city children. A more authoritarian type of discipline is practiced in farm homes, and parental control is accepted in a more or less routine fashion. City children, however, are not so submissive to the authority of their mothers and fathers, and resented questions asked about punishment.

Studies of this nature show that parental attitudes and behavior

have a definite influence upon the personalities of many adolescents. Even when boys and girls profess dislike for certain traits in their fathers and mothers, they tend, nevertheless, to reflect them in their own behavior. It should be noted, also, that practically all conflicts with parental authority stem from the adolescent's desire to be an independent, self-directing individual.

HOW NAMES AFFECT PERSONALITY

An individual's name is important in his relationships with others, and can be a source either of respect or of ridicule. Inappropriate or unusual names may contribute to personality maladjustments, and parents would do well to remember this when choosing names for their children. We have noted already that giving a girl a boy's name, or vice versa, may be an evidence of disguised parental rejection. It is often a constant source of embarrassment and shame to the individual concerned. In an earlier chapter we saw, likewise, that nicknames, especially those resulting from physical peculiarities, may have an adverse effect on personality.

At Harvard University a study²⁹ was made of the given names of 3320 students, and only about a dozen eccentric ones were found. The bearers of these unusual names, however, showed an excess of flunk-outs and psychoneuroses.

More than 30 years ago Mencken³⁰ called attention to unusual surnames and given names used in this country. He cites such odd surnames as James A. Masculine, Ansen B. Outhouse, and George Pig.³¹ Much derision may stem, also, from names like Roach and Hogg, and in cases of this kind it would seem wise to secure a legal change of the surname.

An investigation of the preference value of family names was conducted among a group of Michigan College students.³² It was found that there was less dissatisfaction with Anglo-Saxon names which were easy to pronounce and spell. However, if names were too com-

²⁹ B. M. Savage and F. L. Wells, "A Note on Singularity in Given Names," *Journal of Social Psychology*, 1948, 27:271-272

³⁰ H. L. Mencken, *The American Language* (Alfred A. Knopf, New York, 4th ed., 1936). (Copyright, 1916)

³¹ *Ibid.*, pp. 474-544.

³² R. L. Arthaud, A. N. Hohnack, C. H. Ramsey, and K. C. Pratt, "The Relation of Family Name Preferences to Their Frequency in the Culture," *Journal of Social Psychology*, 1948, 28:19-37.

mon, they tended to be disliked. Women were somewhat more dissatisfied with their family names than were men, the percentages being 33 and 26 respectively.

Mencken also lists some almost unbelievable and outlandish given names. He tells how a devout Mormon named his twin sons Cherubim and Seraphim,³³ and how a girl bore the name Eldarema,³⁴ coined from the first two letters of the names of each of her grandparents: Elkanah, Daniel, Rebecca, and Mary. Some children were named after states, cities, volcanoes, floods, or their names were grandiose, physiological, and pathological terms, as: Utahna, Denver, Mauna Loa, Highwater and Overflow (twins born during a flood), Latrina, Placenta, and Gonadia.

An investigation³⁵ was made, also, of the reactions of 334 Negro college women to their names. Of the entire group 257 liked both their names, but 77 were not satisfied with either one or both of them. Methods of concealing disliked names were use of initials, omitting name, changing the spelling, or adopting nicknames. Of those who disliked their names, 14 felt that their personalities had been affected in that they had become sensitive, shy, and embarrassed when introduced to strangers. Some made changes because they felt that their names were too common, whereas others disliked the sound of their names. Many of the changes were from common to fancy ones, as from Walter to Walta, from Abie to Abril, from Frances to Francina, from Catherine to Wynell, from Dorothy to Mercedes, from Mary to Gwendolyn, from Margaret to Elorine, and from Lee to Lurlene.

It is apparent, therefore, that, although naming children may not seem very important at the time, it may have a definite bearing upon an individual's later adjustment. It has been suggested in fact that it would be desirable to wait until the child is old enough to choose his own name. Because of the necessity for identification in our legal and educational systems, however, such a procedure is impossible. In this connection it is interesting to note that in some cultures a child is given a temporary name before adolescence and a permanent one afterward.

³³ Mencken, *op. cit.*, p. 516.

³⁴ *Ibid.*, p. 521.

³⁵ O. W. Eagleson, "Students' Reactions to Their Given-Names," *Journal of Social Psychology*, 1946, 23:187-195.

HOW THE SCHOOL AFFECTS PERSONALITY

Many people feel that their teachers have had a profound and lasting effect upon their personalities. It is only recently, however, that any systematic attempt has been made to evaluate these subtle teacher-pupil relationships. Several investigations have been conducted to determine objectively the effect which teachers have upon the personalities of children, and also what personality traits in teachers are preferred by their pupils. These studies as yet are limited in scope and their findings cannot be used as a basis for generalizations about all teacher-pupil relationships. Nevertheless, they do suggest some interesting trends, and techniques are being developed which can be employed in future research. We shall consider here three closely related studies dealing with teacher-pupil contacts.

The first of these was primarily methodological,³⁶ with the emphasis upon the definition and rating of dominative versus socially integrative behavior. The term "dominative" refers to "the use of force, commands, threats, shame, blame, and attacks against the personal status of an individual."³⁷ In contrast to this, "socially integrative behavior" implies that "one asks and by explanation makes the request meaningful to the other so that the other can voluntarily cooperate."³⁸ Since the dominating person tries to *make* others conform to his standards and values, he thwarts cooperation, whereas the socially integrative individual *invites* cooperation.

In the initial study, the reactions of children to each other in a play situation were observed. The experiment included 128 preschool children. One group was of normal or superior intelligence. A second group was composed of orphanage nursery school children, and the third was a control group of non-nursery school orphanage children. All participants were checked on eight categories of dominating and four of socially integrative behavior. An experimental playroom with a one-way vision screen and a sandbox and toys was provided. Each child was paired at random with five other children and was observed for five minutes. In addition to the preschool

³⁶ H. H. Anderson and H. M. Brewer, "Studies of Teachers' Classroom Personalities," *Applied Psychology Monographs of the American Psychological Association*, 1945, 1: No. 6.

³⁷ *Ibid.*, p. 9.

³⁸ *Ibid.*

groups, 32 kindergarten children were observed in portable booths set up in gymnasiums or unused schoolrooms.

In general, it was found that, for both the preschool and the kindergarten groups, "when the children with higher domination scores were cross-paired with the children with lower domination scores, those having the higher score became less dominating and those having the lower score became more dominating."³⁹ There were practically no differences in homogeneous sex pairings, but when the sexes were cross-paired, the scores for socially integrative behavior dropped for both boys and girls. The observers found, too, that they were more successful in rating dominative than integrative behavior.

The effect of the teacher's personality upon the 32 kindergarten children was checked next. In order to get an adequate sampling of the teacher's behavior, observation periods totaling 300 to 400 minutes were necessary. It was found that two out of three of the teacher's contacts with the children were dominative, and this domination provoked resistance. The results of both studies showed clearly that because of the differences in their contacts, both with other children and with teachers, individual children in the same classroom may live in quite different psychological atmospheres.

In the second study⁴⁰ the ratings used in the first were revised to include the kind of situation involved, as.

- Domination with evidence of conflict
- Domination with no evidence of conflict
- Domination with evidence of working together

- Integration with evidence of conflict
- Integration with no evidence of working together
- Integration with evidence of working together

Two teachers and 59 children in two second-grade rooms in one school building were observed in situations classified mainly as either dominating or integrating. One teacher was more dominative than the other in her contacts with children, and there was evidence

³⁹ *Ibid.*, p 18.

⁴⁰ Anderson and J. E. Brewer, "Studies of Teachers' Classroom Personalities (Effects of Teachers' Dominative and Integrative Contacts on Children's Classroom Behavior)," *Applied Psychology Monographs of the American Psychological Association*, 1946, 2: No. 8.

that she was less effective. In her room there were more instances of nonconforming behavior, fewer social contributions, and one-third less problem solving.

Observations totaling one hour each were made of teacher-pupil contacts in two fourth-grade rooms containing 71 pupils, about equally divided. Ratings indicated that one teacher used eight times as many integrative contacts as the other. In contrast, the more dominating teacher worked in conflict with her group three times as frequently as she worked with them. In both fourth-grade groups, however, domination was used more than twice as often as integration. When there was integration the children were more spontaneous, showed more initiative, did more problem solving, and contributed more socially. The children did not dominate each other so frequently, and fewer of them exhibited nervous habits.

The generalizations concerning the relations of dominating and integrating behavior in the second and fourth grades were found, also, to be true of sixth grades under a departmental form of organization. For example, one teacher worked *with* her children nine times as frequently as she worked *against* them. At the other extreme, one teacher worked *with* groups of children only three-tenths as often as she worked *against* them.

The third study⁴¹ is a follow-up of the effects of dominative and integrative contacts on children in the two second grades described above. It will be remembered that one teacher was extremely dominative, while the other was more integrative. The following year they were observed again with new groups of second-grade children. The pupils who had participated in the first experiment were also observed during the next year, when they were in the third grade under different teachers. The results showed that after a year the more dominating teacher was again more dominating with the new group of children, while the more integrating teacher continued to be more integrating. The children who were promoted to the third grade under a different teacher did not continue to show the undesirable behavior which they exhibited in the second grade under a dominating teacher. This suggests that the "vicious circle" of teacher

⁴¹ H. H. Anderson, J. E. Brewer, and M. F. Reed, "Studies of Teachers' Classroom Personalities (Follow-up Studies of the Effects of Dominative and Integrative Contacts on Children's Behavior)," *Applied Psychology Monographs of the American Psychological Association*, 1946, 3: No. 11.

domination and pupil resistance can be broken. One wonders, however, what the effect of a dominating teacher upon a child's personality would be over several successive years. The authors of the foregoing studies believe that the domination-resistance situation could be lessened greatly through more emphasis upon mental hygiene in the in-service training of teachers. They think that in many instances the teachers themselves are not aware of their dominating behavior and its effect upon the actions of their pupils.

Another interesting angle of the teacher-pupil relationship is found in a survey of traits liked and disliked in teachers by 10,000 high school seniors enrolled in 66 high schools located in various sections of the country.⁴² This information should be fairly representative, since schools in both large and small cities, as well as in rural areas, were included. Each student was free to express his opinions, since he was not required to sign the questionnaire, and every effort was made to prevent the betrayal of his confidence. On the whole, the pupils took the task seriously and there was little, if any, evidence of "horseplay."

Space does not permit us to list all the characteristics ascribed to the best-liked teachers. Only the five highest mentioned by 3725 high school seniors will be given. These are:⁴³

| Characteristics of Best-Liked Teachers | Frequency of Mention | Rank |
|---|-------------------------|------|
| Is helpful with school work, explains lessons and assignments clearly and thoroughly, and uses examples in teaching | 1950 | 1 |
| Cheerful, happy, good-natured, jolly, has a sense of humor, and can take a joke | 1429 | 2 |
| Human, friendly, companionable, "one of us" | 1024 | 3 |
| Interested in and understands pupils | 937 | 4 |
| Makes work interesting, creates a desire to work, makes class work a pleasure | 805 | 5 |

The characteristics of the least-liked teachers are numerous, also; hence only the five ranking highest are given:⁴⁴

⁴² "Ten Thousand High-School Seniors," *Teachers and Teaching* (collected, compiled, and analyzed by F. W. Hart) (The Macmillan Company, New York, 1934).

⁴³ *Ibid.*, quoted from Table I, p. 131. (By permission of The Macmillan Company, publishers.)

⁴⁴ *Ibid.*, quoted from Table II, p. 250. (By permission of The Macmillan Company, publishers, 1934.)

| Characteristics of Least-Liked Teachers | Frequency of Mention | Rank |
|---|-------------------------|------|
| Too cross, crabby, grouchy, never smiles, nagging, sarcastic, loses temper, "flies off the handle" | 1708 | 1 |
| Not helpful with school work, does not explain lessons and assignments, not clear, work not planned | 1025 | 2 |
| Partial, has "pets" or favored students, and "picks on certain pupils" | 859 | 3 |
| Superior, aloof, haughty, "snooty," overbearing, does not know you out of class | 775 | 4 |
| Mean, unreasonable, "hard boiled," intolerant, ill mannered, too strict, makes life miserable | 652 | 5 |

It is evident that high school pupils are keenly aware of the personality traits exhibited by their teachers. One can hardly doubt that these wide differences in the characteristics of teachers have a definite influence upon the personalities of adolescents. To be required to spend years in the classroom of a teacher one thoroughly dislikes is an experience which is bound to leave its mark. On the contrary, association with a teacher who is liked and respected will certainly have a constructive effect upon the developing personality.

It is interesting and significant that adults generally do not understand the personality traits of children and young people. They tend to be annoyed by the talkativeness and curiosity exhibited by many children, especially when they pry into personal affairs and monopolize adult conversation. Children like to boast about their exploits and the wonders which big brothers or strong fathers can perform, and also about their possessions. The last-named tendency is illustrated by the following conversation between two small girls who were comparing two little pitchers which they owned:

"Mine is the biggest." "No, mine." "Mine is so big Mama and Papa and everybody can drink from it."

"Jesus can drink from mine," retorted the other.

Not to be outdone, the first terminated the argument by saying, "Mine reaches clear up through a hole in the sky and God drinks from it."⁴⁵

Youngsters are brutally frank, too, in passing judgment upon the achievements and shortcomings of children and adults alike. They

⁴⁵ From *The Child* by F. B. Sherbon (1934), p. 584. (Courtesy of McGraw-Hill Book Company, Inc., New York.)

wish to be treated as if they were grownups and resent being referred to as "dear little children," "my little man," "little lady," etc. Adolescents particularly are eager for adult status and, as we have seen, are striving constantly to achieve independence in thought and action. Even though much of their behavior still is childish and immature, there is nothing they resent more than being "treated like babies."

The noise and the more overt types of behavior to which grownups object actually need not cause apprehension from the standpoint of personality development. More subtle tendencies, however, which may lead to serious consequences, are often overlooked. This is well illustrated by a study⁴⁶ wherein teachers and clinicians were asked to rate the most serious and the least serious behavior traits of 1675 children in the Minneapolis and Cleveland schools. The teachers listed *stealing, heterosexual activity, obscene notes, pictures, etc., untruthfulness, lying, and masturbation* as among the most serious, while clinicians named *unsocial and withdrawal responses, suspiciousness, unhappiness and depression, resentfulness, and fearfulness*. In rating the least serious traits one group of teachers enumerated *fearfulness, unsocial and withdrawing tendencies, sensitiveness, inquisitiveness, and shyness*. Another group listed *tattling, whispering, sensitiveness, restlessness, and shyness*, whereas clinicians included as least harmful *disorderliness, profanity, interrupting, and talkativeness, smoking, and whispering*. It will be noted that the teachers placed much emphasis upon sex interests, which, as we have seen, are normal but require proper guidance. They underestimated, however, those traits which are the result of emotional suppression and hence produce conflict and maladjustment. In general, teachers were concerned most about the types of behavior which interfered with what they were trying to accomplish.

These results have been confirmed by a more recent survey⁴⁷ of 1150 problem cases in New Haven, Connecticut, from the kindergarten through the eighth grade. The types of behavior which were reported most frequently by teachers were "talking without permission," "inattention," and "violation of work rules."

⁴⁶ E. K. Wickman, *Children's Behavior and Teachers' Attitudes* (The Commonwealth Fund, Division of Publications, New York, 1928).

⁴⁷ I. Y. Masten, "Behavior Problems of Elementary School Children. A Descriptive and Comparative Study," *Genetic Psychology Monographs*, 1938, 20 123-181.

Somewhat different from these two studies is an investigation of the classroom disturbances of 68 eighth-grade boys and girls under 23 practice teachers in a school in Albany, New York.⁴⁸ Instead of centering attention upon the teacher's attitude toward classroom behavior, this study tried to understand the motives underlying the pupils' annoying conduct.

Although whispering is given as the most prevalent type of disturbance, especially among girls, there are many others, such as: *interest in another person*, *unnecessary noise* (girls), *talking* (girls), *laughing*, *moving around* (boys), *"wisecracks"* and *silly remarks* (more by boys), *disobedience*, *pushing or scuffling* (boys), *fighting* (girls), *protest*, *criticism or complaint*, *bullying* (boys), *throwing objects* (girls), *passing notes* (girls), *exaggerated gestures* (boys), and *seizing property of others* (boys).

Despite the fact that the same kinds of behavior were reported for both sexes, "boys showed more total disturbances and recipience than girls and more disturbing behavior in all categories except whispering."⁴⁹ More incidents occurred under women than under men teachers, especially if they were young. Teachers with high scholarship tended to have more classroom disturbances than did those whose achievement was lower. There was little transfer from theory to the actual handling of boys and girls in the classroom.

When asked why they engaged in such annoying behavior the students gave the following reasons:⁵⁰ *to relieve frustration*, *to break monotony*, *to have fun*, *to get recognition*, and *to tease or irritate*.

Here again there was little or no evidence of genuine insight into pupil behavior. Teachers tended to adopt a "punitive" attitude, and dealt with symptoms rather than with causes. Since they were so concerned with the preservation of classroom routine, these teachers preferred children who were less active and more compliant.

The studies cited thus far have dealt with the appraisal of children by their teachers, and of teachers by their pupils. We must not forget, however, that the relationships of children with each other are highly important, as we have indicated in previous chapters. What children think of each other may be quite different from the reputation which

⁴⁸ M. L. Hayes, *A Study of the Classroom Disturbances of Eighth Grade Boys and Girls* (Contributions to Education No. 871, Bureau of Publications, Teachers College, Columbia University, New York, 1943).

⁴⁹ *Ibid.*, p. 41.

⁵⁰ *Ibid.*, p. 87, also p. 92.

they have with adults. This has been shown clearly by the use of the "Guess Who Technique" where pupils are asked to match the names of classmates with given trait descriptions, as will be explained in greater detail in the following section.

HOW WE EVALUATE PERSONALITY

The evaluation and measurement of personality are difficult because of its complex structure. One's approach to this problem will be governed largely by his point of view concerning the nature and organization of personality.⁵¹ For instance, if one believes in the "atomistic" approach, he will look upon personality as an aggregate of separate traits. According to this view, measurement and evaluation are accomplished by the use of such devices as rating scales, questionnaires, and the typical paper-and-pencil tests which seek to analyze personality into its elements. On the other hand, if one accepts the "global" theory or allied concepts, he will regard personality as a dynamic whole functioning in the social environment. He will be concerned, therefore, with evaluative techniques which are designed to gain insight into the individual's private world. Moreover, he will try to understand how a person's total responses to particular types of situations reveal his inner thoughts and feelings. Symbolic play, easel painting, finger painting, and reactions to pictures and ink blots illustrate this type of approach and are known as projective techniques.

In this section we shall describe some methods of personality appraisal which are representative of both of the foregoing points of view.

ATOMISTIC MEASUREMENTS

Rating Scales

Rating scales are useful in evaluating the personality traits of children and adolescents. They may be self-ratings, where the individual checks himself, or the evaluations may be made by one or more people who know him well. In the former the person may be tempted to overrate his abilities, and thus invalidate the results. If the latter method is employed, a fair estimate can be made only if

⁵¹ For a clear summary read H. Sargent, *op. cit.*; consult also L. K. Frank, "Projective Methods for the Study of Personality," *Journal of Psychology*, 1939, 8:389-413.

the judgments of several people are pooled. The accompanying excerpt is from a graphic rating scale in which each trait receives a numerical value between one and five points corresponding to such descriptions as "very superior, superior, average, inferior, or very inferior." The traits measured are classified as "intellectual, volitional, moral, emotional, physical, and social." The rater is asked to check the certainty of his judgment on the line below each trait.

PERSONALITY RATING SCALE⁵²

TRAIT 4. SELF-CONFIDENCE

Extreme self-confidence and self-reliance. Always relies on own judgment. Courts responsibilities

Decidedly self-confident

Rather self-confident

Average for age

Rather self-distrustful

Decidedly self-distrustful

Extreme lack of self-confidence. Distrusts own judgment. Afraid of responsibilities.

Was your judgment on the above trait very certain, fairly certain, rather uncertain, very uncertain? (Underline)

TRAIT 5. WILL POWER AND PERSEVERANCE

Extraordinary will power. Persistent in overcoming difficulties. Extremely steadfast. Never gives up.

Decidedly strong-willed and persevering

Rather persevering

Average for age

Gives up rather easily

Decided lack of will power and persistence

Extreme lack of will power. Easily discouraged and gives up at slightest difficulty.

Was your judgment on the above trait very certain, fairly certain, rather uncertain, very uncertain? (Underline)

TRAIT 8. SENSE OF HUMOR

Extraordinarily keen sense of humor. Witty. Appreciates jokes. Sees the funny side of everything

Decidedly keen humor

Rather keen humor

Average for age

Rather little humor

Decidedly little humor

Extremely lacking in sense of humor. Serious and prosy. Never sees the funny side.

Was your judgment on the above trait very certain, fairly certain, rather uncertain, very uncertain? (Underline)

⁵² Reprinted from *Genetic Studies of Genius*, Vol. I, by Lewis M. Terman with the permission of the author and of the publishers, Stanford University Press.

Questionnaires

Questionnaires and inventories are used widely in judging personality at all levels of development. Despite their popularity they are subject to much error, and great care must be exercised in formulating the questions so that they are definite, unambiguous, and not artificial. The most obvious difficulty with this type of measurement is that the individual tends to answer questions as he thinks they *ought* to be answered rather than in accordance with his real feelings and behavior. From this standpoint, the responses of more naive and less intelligent individuals often are more valid than are those of brighter persons who have greater insight into the situation.⁵³ Notwithstanding these inherent shortcomings of questionnaires, they are helpful in furnishing a rough estimate of an individual's strong and weak points in relation to his personal and social adjustment.

Most of the questionnaires in current use are derived from psychoneurotic inventories, such as those described in Chapter 9. We shall mention only a few of the more popular ones, most of which are designed for adolescents and adults.

*The Bell Adjustment Inventory*⁵⁴ of 140 questions yields four measures of adjustment—home, health, social, and emotional—and separate norms are provided for each sex at the high school and college levels.

*The Personality Schedule*⁵⁵ by L. L. Thurstone and T. G. Thurstone contains 223 items standardized on 694 freshmen at the University of Chicago. On the basis of their scores, students are diagnosed as: "extremely well adjusted; well adjusted; average; emotionally maladjusted; should have psychiatric advice."

Since its publication in 1931, the *Bernreuter Personality Inventory*⁵⁶ has been one of the most widely used instruments for diagnosing personality. It is made up of 125 items and yields scores for: neurotic tendency, self-sufficiency, introversion, social dominance,

⁵³ A. Ellis and H. S. Conrad, "The Validity of Personality Inventories in Military Practice," *Psychological Bulletin*, 1948, 45:385-426.

⁵⁴ Devised by H. M. Bell and published by Stanford University Press, Stanford University, California.

⁵⁵ Sold by the University of Chicago Press and described in detail by the authors in *Journal of Social Psychology*, 1930, 1:3-30.

⁵⁶ By R. G. Bernreuter, Stanford University Press, Stanford, Calif., 1931, 1935. For a critical evaluation read D. E. Super, "The Bernreuter Personality Inventory," *Psychological Bulletin*, 1942, 39:94-119.

self-consciousness, and solitariness. According to statistical studies, the parts of the test that are supposed to measure neurotic tendency, introversion, and self-consciousness are practically identical, and therefore are measuring the same traits. Although it is designed to be given as either an individual or a group test, the Bernreuter Personality Inventory is more satisfactory when administered to groups. Percentile norms are available for male and female high school students, college students, and adults.

A more recent instrument appearing first in 1939, with several later revisions, and embodying the principle of the questionnaire, is the *California Test of Personality*.⁵⁷ Its fundamental purpose is "to show how successful or unsuccessful a pupil is in meeting his problems." Scales are now available from grade 1 to the adult level: primary, elementary, intermediate, secondary, and advanced.

The scale is divided into two parts: (1) self-adjustment, i.e., "what he feels and thinks about himself," and (2) social adjustment, i.e., how the individual gets along with others. Under the first classification are included: "self-reliance; sense of personal worth; sense of personal freedom; feeling of belonging; freedom from withdrawing tendencies; and freedom from nervous symptoms." The second classification comprises the following: "social standards, social skills; freedom from antisocial tendencies; family relations; school relations; and community relations."

The responses are arranged in profile form so that it is possible to see wherein an individual deviates from others. Suggestions are given in the manual for the more effective guidance of personal and social development. In so far as possible, items touching sensitive personal or social problems are disguised in order to rationalize them for the student. The following are examples:

1. Are your tests so hard or unfair that it is right to cheat?
2. Do your classmates quarrel with you?
3. Do you suffer more than most people when you are ill?

*The Minnesota Multiphasic Personality Inventory*⁵⁸ by Hathaway and McKinley is an interesting adaptation of the standard question-

⁵⁷ Devised by L. P. Thorpe, W. Clark, and E. W. Tieg, and sold by the California Test Bureau, 5916 Hollywood Boulevard, Hollywood 28, Calif. Quoted by permission of the authors and the California Test Bureau.

⁵⁸ S. R. Hathaway and J. C. McKinley, *The Minnesota Multiphasic Personality Inventory* (The Psychological Corporation, New York, rev. ed.). (Copyright 1943 by the University of Minnesota.)

naire. The test consists of 550 statements printed on cards which the subject classifies as "true," "false," or "cannot say." The items cover a wide range of topics, including: health, habits, family relationships, obsessions and compulsions, attitudes toward sex, social attitudes, political attitudes, phobias, morale, etc. The subjects' responses are translated into standard scores which are plotted on a profile chart. These, in turn, are interpreted from a psychiatric point of view, and the *pattern* of traits is considered to be more significant than the manifestation of any single abnormal trait. Clinical training and experience are necessary in order to make a diagnosis of the individual being examined. It is claimed that the norms are fairly adequate for both sexes from 16 to 55 years of age.

*Trait Identification*⁵⁹

Another device for evaluating personality is through trait identification. An illustration of this is the "Guess Who Technique" referred to at the end of the preceding section. This method has been used most effectively in school situations, particularly in the sixth grade and above, to ascertain the child's judgment of his peers. Its success is dependent upon a number of factors, important among which are the maturity of the pupils, the number of traits to be checked, and the teacher's attitude in presenting the material.

Students are given mimeographed sheets containing a number of personality traits arranged in contrasting pairs, as "restless-quiet, talkative-silent; daring-afraid," etc., with the favorable items usually preceding the unfavorable. They are then asked to write, in the six spaces provided, names of classmates who fit the description. The individual may or may not sign his name, and no pupil is informed of the outcome of the survey.

Directions from Stoke's adaptation are as follows:⁶⁰

⁵⁹ Consult the adaptation made by S. Stoke, "The Social Analysis of the Classroom" (Division on Child Development and Teacher Personnel, Commission on Teacher Education, American Council on Education, Chicago, January, 1940) (mimeographed); read also C. M. Tryon, "Evaluations of Adolescent Personality by Adolescents," in R. G. Barker, J. S. Kounin, and H. F. Wright (eds.), *Child Behavior and Development* (McGraw-Hill Book Company, Inc., New York, 1943), chap. 18.

⁶⁰ Reproduced by permission of the Division on Child Development and Teacher Personnel of the Commission on Teacher Education, University of Chicago.

Below are some word pictures of members of your class. Read each statement and write down the names of the persons whom you think the description fits.

Remember

One description may fit several persons

You may write as many names as you think belong under each.

The same person may be mentioned for more than one description

Write [your name] if you think the description fits you.

If you cannot think of anyone to match a particular description, go on to the next one.

The following examples of trait descriptions are reproduced from Stoke's publication:⁶¹

Here is someone who can work very quietly without moving around in his (or her) seat.

Here is someone who likes to talk a lot, always has something to say.

Here is someone who is always ready to take a chance at things that are new and unusual, is never worried or frightened.

Here is someone who is always worried or scared, who won't take a chance when something unexpected or unusual happens.

Here is someone who can enjoy a joke and see the fun in it even when the joke is on himself (or herself).

Here is someone who can never appreciate a joke when it is on himself (or herself).

The teacher summarizes the results by listing each description by one trait name across the top of a large sheet of paper. Each student's name is recorded on the side, and tallies are made showing the frequency of the traits checked as applicable to him.

The following is an illustration:

| | Restless | Quiet | Daring | Afraid | Humor— self | Humor— less— self | Happy | Unhappy | Leader | Follower |
|----------|----------|-------|--------|--------|----------------|-------------------------|-------|---------|--------|----------|
| John C. | /// | | | // | | // | | //// | | / |
| Harry A. | | // | | /// | //// | | / | | | / |

In order to check upon the differences in sex standards, it is recommended that boys' and girls' ratings be tabulated separately.

⁶¹ Reproduced by permission of the Division on Child Development and Teacher Personnel of the Commission on Teacher Education, University of Chicago.

Such a device enables the teacher to see at a glance the personality traits of each youngster as judged by his peers, and thus makes it possible for her to help each one as an individual.

Before the teacher administers these trait ratings it would be well for her to check each child herself, and then compare her opinions with those of the pupils.

PROJECTIVE TECHNIQUES

Play Therapy

Among the projective methods for the study of personality used at the Counseling Center of the University of Chicago is a particular type of play therapy.⁶² Although it is based on the Roger nondirective counseling technique, the term "self-directive" is preferred because it is more accurate. Play is regarded as the natural medium through which the child expresses himself and through which he can play out his feelings and problems. The Chicago technique differs from the older methods, in which the therapist guides and interprets the child's behavior. Here the responsibility is left to the child, and his adjustment depends upon how soon he gets insight into the idea of self-direction. In the play-therapy room the child is unhampered by the many restrictions prevailing in the usual home situation. No one orders him around or gives him suggestions. He is not reproved or criticized, no one intrudes upon him, and his confidences are respected. He can express his "accumulated feelings of tension, frustration, insecurity, aggression, fear, bewilderment, and confusion."⁶³ By bringing these feelings to the surface he can face them, abandon them, or learn to control them. The principle underlying this technique is that all individuals in their process of growing up are "fighting for maturity, independence, and a right to be themselves." It is a technique which can be applied equally well to groups or to individuals, and is satisfactory for improving social adjustments. It is not recommended, however, for emotional difficulties which are deep-seated.

When asked by another child what he did in the play-therapy room, an eight-year-old boy gave the following spontaneous description:

⁶² V. M. Axline, *Play Therapy: The Inner Dynamics of Childhood* (Houghton Mifflin Company, Boston, 1947).

⁶³ *Ibid.*, p. 16.

. . . You play. That's all. You just play. . . . I mean I wouldn't know how to do what she does [referring to therapist]. I don't even know what she does. She doesn't seem to do anything. Only all of a sudden, I'm free. Inside me, I'm free. (He flings his arms around.) I'm Herb and Frankenstein and a devil. (He laughs and pounds his chest.) I'm a great giant and a hero. I'm wonderful and I'm terrible I'm a dope and I'm so smart. I'm two, four, six, eight, ten people, and I fight and I kill! . . . I'm good and I'm bad and still I'm Herby. I tell you I'm wonderful. I can be anything I want to be!⁶⁴

In equipping a room where the child can unburden himself and gain insight into the solution of his own problems, many materials are suggested, as:⁶⁵

| | |
|---|---|
| nursing bottles | sand |
| doll family | water |
| doll house with furniture | toy guns |
| toy soldiers and army equipment | peg-pounding sets |
| toy animals | wooden mallet |
| playhouse materials | paper dolls |
| table | little cars |
| chairs | airplanes |
| cot | a table |
| doll bed | an easel |
| stove | an enamel-top table for finger painting and clay work |
| tin dishes | toy telephone |
| pans | shelves |
| spoons | basin |
| doll clothes | small broom, mop, rags |
| clothesline, clothespins, and clothes basket | drawing paper |
| a didee doll | finger-painting paper |
| a large rag doll | old newspapers |
| puppets | inexpensive cutting paper |
| a puppet screen | pictures of people, houses, animals, and other objects |
| crayons | empty berry baskets to smash |
| clay | |
| finger paints | |

Where a carrying kit is feasible, the following play materials are listed:

⁶⁴ *Ibid.* Reproduced from pp. 19 and 20 with permission of the publishers.

⁶⁵ *Ibid.* Reproduced from p. 56 with permission of the publishers.

| | |
|---|-----------------|
| doll family and a few pieces of furniture in proper scale, including beds, tables, and chairs | crayons |
| nursing bottles | toy guns |
| clay | toy soldiers |
| boxes of paints | toy car |
| drawing paper | puppets |
| | a rag baby doll |
| | telephone |

The above illustrates only one way of using play to evaluate personality. Actually, the possibilities of this method are as diverse as the materials which can be employed and the ways in which they can be presented.⁶⁶ It must be remembered, moreover, that variations in materials and technique may have pronounced effects upon the results obtained.⁶⁷ It has been shown, for instance, that realistic play materials, e g., doll furniture, encouraged more exploratory activity, whereas blocks, with only a vague resemblance to furniture, resulted in less exploration but more organizing activity. That is, the children playing with blocks spent more time arranging their "furniture," than did those with realistic materials. Other factors influencing the responses which children make to play situations are: the degree of organization of materials when first presented, the amount of fantasy and identification which they stimulate, the amount of control and direction exercised by the examiner; and the length of the play period. Whether dolls are presented singly or in family groups makes a great deal of difference in the extent to which a child identifies himself with them, and hence affects his play behavior.

Easel Painting

Extensive research at the University of Chicago⁶⁸ has demonstrated the value of easel painting as a projective technique in the understanding of the personalities of preschool children. Case studies and daily observations were made on 150 young children for one

⁶⁶ E. Lerner and L. B. Murphy (eds.), "Methods for the Study of Personality in Young Children," *Monographs of the Society for Research in Child Development*, 1941, 6, Parts I-III; read, also, M. S. Fisher and L. J. Stone, "Explanatory Notes on the Series of Films: *Finger Painting*; *Balloons*; *Frustration Play Techniques*; and *This Is Robert*," New York University Film Library, 71 Washington Square South, New York 12, N.Y.

⁶⁷ R. R. Sears, "Influence of Methodological Factors on Doll Play Performance," *Child Development*, 1947, 18:190-197.

⁶⁸ R. H. Alschuler and L. B. W. Hattwick, *Painting and Personality* (University of Chicago Press, Chicago, 1947), Vols. I and II.

year and on 20 of the same subjects during a second year. Analyses of personality were based upon the manner in which *color*, *line*, *form*, and *space* were employed in symbolic easel paintings. At first glance this may seem like a simple matter, but actually the use of this technique requires considerable skill and background. Interpretations must be guided by a knowledge of the child's behavior in areas other than easel painting. These should be supplemented by careful day-by-day observations and by comparisons with developmental trends as expressed in other children.

A substantial amount of data has been accumulated to confirm the statement that children express "the hurt and happiness of life" in their paintings. This is true especially before five, when they are preoccupied with feelings about self. Between 5 and 10 years they become more interested in things around them, and absorption with self is not so evident again until adolescence.

Most parents are interested in the representative drawings which children make, but are inclined to cast aside their scribbles and daubs of color. These unstructured creations, however, are claimed to be highly significant in the interpretation of the young child's inner life.

To the therapist, colors furnish the best clues to the understanding of emotional expression. Of secondary importance are line and form, and the utilization of space.

The authors of the Chicago study admit that some of their statements smack of charlatanism, but they feel that there is sufficient evidence to confirm their results. The idea that "color is the language of the feelings" may seem like somewhat of an overstatement to the prosaic individual. Thus, it is claimed that children who use warm colors, such as red, yellow, or orange, do so to express affection, hostility, or aggression. On the contrary, more emotionally mature children are said to use cool colors, such as blue, black, green, and brown. It is claimed, furthermore, that there is an absence of blue in the paintings of highly emotional children. Yellow is supposed to indicate that the child is happy and carefree. Painting one color over another is referred to as "overlaying," and is felt to be highly significant. For example, a gay child who becomes fearful may overlay yellow with black or purple. Blue, however, is used most frequently as an overlay for warm colors. Conflicts over remaining infantile or growing up may be expressed in yellow with a blue overlay, yellow

representing the desire for infantilism and blue for maturity. Blue with an overlay of brown may indicate a conflict over cleanliness, blue representing the desire for maturity and brown the lack of bowel control!

As the end of the preschool approaches, the child tends to express himself by the use of representative paintings rather than by unstructured forms. Circles are interpreted as an indication of "immaturity, dependence, submissiveness, and self centeredness," whereas straight lines may signify "a more assertive, outgoing type of behavior."

A child's relationship to his environment is purported to be shown both by the amount of space which he uses and by the placement of his painting. Immaturity is revealed by painting beyond the border or all over the page. It was found that children who painted within a restricted area were withdrawn and emotionally dependent, whereas those whose paintings were in proportion to the page were well adjusted and popular both with children and with adults.

Finger Painting

Finger painting, which is described in considerable detail in Chapter 14, also may serve as a projective device for both children and adults.⁶⁹ Its value lies primarily in its plasticity and the freedom with which it can be manipulated without training in special skills. In these respects it is similar to clay, mud, and cold cream as a means for emotional release. Through finger painting the individual can "paint out" his conflicts, frustrations, and aggressions, and thus secure a certain amount of relief from tension. Even with visually handicapped individuals,⁷⁰ who experience more thwarting in their daily lives than do those with normal sight, finger painting has proved to be not only a means of creative expression but a therapeutic device as well. As is true of most projective techniques, the greatest difficulty with finger painting is the lack of objectivity in its interpretation. The examiner must be careful not to read too much into the paintings of those whose personalities he is trying to diagnose.

⁶⁹ J. E. Bell, *Projective Techniques: A Dynamic Approach to the Study of the Personality* (Longmans, Green and Company, New York, 1948), chap. 18.

⁷⁰ P. J. Napoli and W. H. Harris, "Finger Painting for the Blind," *Journal of Psychology*, 1948, 25:185-196.

*The Rorschach Test*⁷¹

One of the most widely used projective techniques for the study of personality is the Rorschach Test, devised by a Swiss psychiatrist, Hermann Rorschach. Although some psychologists consider this test the best means for analyzing personality structure, others are decidedly skeptical about its merits. Its use has been confined primarily to adults, although it can be employed with children. It is considered unsatisfactory, however, with individuals below four years of age.⁷²

The material consists of reproductions of ten standardized ink blots, some of which are colored. Taking them one at a time the subject is asked to tell what he sees in the blots, thus expressing his own inner tendencies.

Each response is scored in several ways: (a) for location, or the part of the blot used in the interpretation; (b) for determinants, or the qualities such as form, color, shading, and movement which may influence the interpretation; (c) for content, or the specific kind of thing seen, (d) for whole or detail responses, i.e., to what extent the subject interprets the blots as wholes or units, and to what extent he is concerned with parts as separate from the whole; and (e) for the commonness or variety of responses (popularity or originality). Despite the fact that scoring is largely subjective, it is claimed that there is a high degree of consistency among trained examiners when scoring the same test. The interpretation of a Rorschach record is difficult and time-consuming, and requires special training.

The standard method of administration is individual, the subject examining one card at a time and giving his responses orally. More recently, a group method has been devised in which the ink blots are reproduced on slides and projected onto a screen, with each subject writing his own responses.

⁷¹ Read R. Bochner and F. C. Halpern, *The Clinical Application of the Rorschach Test* (Grune and Stratton, New York, 1942); B. Klopfer and D. M. Kelley, *The Rorschach Technique* (World Book Company, Yonkers, 1942); M. R. Hertz, "Rorschach: Twenty Years After," *Psychological Bulletin*, 1942, 39 529-572; F. K. Merry, "Rorschach Test," in H. N. Rivilin and H. Schueler (eds.), *Encyclopedia of Modern Education* (The Philosophical Library, New York, 1943), pp. 694-695; G. Murphy, *Personality: A Biosocial Approach to Origins and Structure*, pp. 673-683

⁷² L. B. Murphy, "The Appraisal of Child Personality," *Journal of Consulting Psychology*, 1948, 12:16-19, see p. 18.

Rorschach enthusiasts have been criticized sharply⁷³ for building up a highly subjective system of interpretation and developing a "specialized jargon," unrelated to accepted psychological terminology. It is recommended that the method be given thorough scientific study with a view to discovering a more objective basis for its evaluation as a technique in the diagnosis of personality.

*Thematic Apperception Test*⁷⁴

Probably second only in popularity to the Rorschach method is Murray's Thematic Apperception Test, generally known as the T.A.T. The present revision consists of 19 pictures and one blank card arranged in two series of 10. An hour is required for each series, and a day is supposed to intervene between the presentation of the first and second parts.

The subject is asked to make up stories about each of the pictures, and it is hoped that he will identify himself with them. In so doing it is believed that he will reveal "some of the dominant drives, emotions, complexes and conflicts" of his personality.

Like the Rorschach, the scoring of the T.A.T. is extremely difficult, and only a trained worker is capable of diagnosing the subject's inner self. Although most of the individuals examined by the author of this test ranged in age between 14 and 40 years, other research has shown that satisfactory results can be obtained from children as young as seven years.⁷⁵

The foregoing are only a few illustrations of the ingenious projective methods which have been developed to evaluate personality.⁷⁶ They have yielded much valuable information, but, as we have pointed out, their interpretation is highly subjective and consequently open to error.⁷⁷ If more objective methods of scoring and

⁷³ L. L. Thurstone, "The Rorschach in Psychological Science," *Journal of Abnormal and Social Psychology*, 1948, 43.471-475.

⁷⁴ See G. Murphy, *op cit.*, pp 670-673, H A Murray, *Thematic Apperception Test Manual* (Harvard University Printing Office, Cambridge, Mass., 1943), Bell, *op cit*, chap 8, R. Harrison, "The Thematic Apperception and Rorschach Methods of Personality Investigation in Clinical Practice," *Journal of Psychology*, 1943, 15.49-74

⁷⁵ L. B. Murphy, *op. cit.*

⁷⁶ For a complete account consult Bell, *op. cit.*

⁷⁷ For a defense of projective methods read L. K. Frank, *Projective Methods* (Charles C. Thomas, Springfield, Ill., 1948), chap. 5.

interpretation can be devised, the usefulness of these techniques will be increased substantially.

PERSONALITY PROBLEMS⁷⁸

We have defined personality as the unique manner in which an individual's various traits are functionally related. The effectiveness of one's adjustment, therefore, will depend upon the degree to which these traits or groups of traits are balanced and integrated. We do not know what "perfect adjustment" is, but when certain characteristics become sufficiently exaggerated we are able to recognize them as the causes of personality problems. In general, it may be said that good life adjustment results when there is a reasonable amount of agreement between what the individual thinks of himself and what others think of him. When such agreement does not exist, the individual frequently develops substitute reactions which may or may not be socially approved. These substitutes may bring about a temporary solution, but they seldom produce the permanently effective adjustment which accrues from a direct approach. Furthermore, when artificial mechanisms become habitual, they may interfere so seriously with personality development as to far outweigh their value as a means of giving temporary relief from tension.

When children or adolescents feel inferior because of some physical condition, school failure, or home situation, they may try to compensate by extreme bragging and showing off, or by bullying smaller children. They may also seek attention by indulging in all sorts of bizarre or grotesque behavior, such as talking loudly, making faces, interrupting others, and creating a general disturbance. Punishment is rarely efficacious in dealing with such problems. In fact it often aggravates them by itself becoming an attention-getting mechanism. Probably the best solution is to provide opportunities wherein the individual can feel adequate and successful, and thus remove the necessity for overcompensation. It must be remembered that a certain amount of boasting and self-assertiveness is normal during childhood and youth. If these tendencies become too marked, however, they will interfere seriously with the social acceptance of the individual.

⁷⁸ Symonds, *The Dynamics of Human Adjustment* (Appleton-Century-Crofts, Inc., New York, 1946), J. J. B. Morgan, *How to Keep a Sound Mind* (The Macmillan Company, New York, rev. ed., 1946); H. N. Rivlin, *Educating for Adjustment* (Appleton-Century-Crofts, Inc., New York, 1936).

We are all familiar with the child or adolescent who always blames his shortcomings upon someone else. School failure is attributed to the unfairness of the teacher; another pupil earns high grades because he is the "teacher's pet." Inability to get along well with others is due to *their* bad manners or ill temper. This defense reaction, known as projection, is present to some extent in most individuals. If it becomes too pronounced, however, it prevents the recognition of responsibility toward others and interferes with social insight. Gentle but firm insistence that the individual accept whatever blame is obviously due him, and not shift it to others, is usually the most satisfactory way of handling projection.

Another well-known defense reaction is rationalization, or the "sour grapes" attitude. Here the individual advances a reason for his behavior or attitude which is not the true one but which helps him to maintain his prestige. For example, a child who really desires a toy similar to that possessed by a playmate may say that he does not want it and would not have it if it were offered to him. In the same way, an adolescent may desire greatly to be invited to join some club or society. If he does not receive an invitation he may compensate for his disappointment by averring that the group is "a bunch of snobs" and that he would not belong to it if he had the chance. Providing more social contacts and encouraging frankness and sincerity will aid in preventing abnormal rationalizations.

When children or adolescents do not have adequate social and emotional experience in a real situation they frequently try to secure it artificially. This is sometimes done through "identification," wherein the individual tries to identify himself with the hero or other characters in a story or movie, or with persons whom he greatly admires. A moderate degree of this mechanism may not be undesirable, especially if heroes are adopted who have acceptable social qualities. Extreme identification with gangsters and similar antisocial individuals, however, may be the source of serious behavior problems. Excessive reading and movie attendance also interfere with recreational activities and diminish opportunities for social contacts.

Perhaps the most serious artificial adjustment mechanism is fantasy or daydreaming. In this a person attempts to escape from the world of reality by creating imaginary situations in which he is the center of attention. If he thinks he is unfairly treated he may imagine himself to be a "suffering hero," receiving sympathy and commenda-

tion from everyone. If opportunities for a reasonable amount of self-assertion are denied him, his fantasy may create a situation wherein he becomes a "conquering hero," receiving the plaudits and adulation of the multitude. Although daydreaming is somewhat more prevalent during adolescence, it frequently is indulged in by smaller children. When it serves as a stimulus to activity, it may prove to be an asset, but when it becomes a substitute for action, it is potentially harmful. The individual who lives in a world of fancy which is completely satisfying tends to withdraw more and more from reality and to lose interest in real life situations. It has been suggested that the reason daydreaming is so common at adolescence is that a greater amount of frustration is experienced at this period. Although the individual is biologically mature, he is still far from being accepted socially as an adult. Awakened sex interests and vocational ambitions find no opportunities for fulfillment in the world of reality and, therefore, are expressed as fantasies. In our culture, probably the best antidote for excessive daydreaming is to guide the individual into satisfying social and recreational activities. Part-time employment for adolescents may be helpful, because it not only provides a feeling of achievement and responsibility but also brings tangible economic returns.

Another method of escaping unpleasant reality which is frequently encountered is the tendency to feign illness. The "nine-o'clock" headache, which makes school attendance impossible, disappears miraculously by midmorning, enabling the child to play energetically for the remainder of the day. Errands to be run, dishes to be washed, and similar household duties also seem to have the power of evoking "illness." In such cases, if a careful medical examination reveals no physical disturbance, the professed symptoms should be ignored. Harmless but distasteful medicine, deprivation of privileges, and insistence upon the performance of regular duties often effect "cures."

These represent only a few of the indirect methods that children and adolescents use in making adjustments. Although they are not all equally serious, they are often indications of a conflict between the individual and his environment. To deal with them effectively, the cause of this conflict must be located and removed, and the individual's behavior redirected. It should be emphasized that no panacea exists which can be applied to all personality problems. Each case has its own distinctive features and background and must be

treated individually. Generally, however, the encouragement of direct approaches and adequate opportunities for self-expression and social cooperation will help to prevent the abnormal use of artificial mechanisms.

Every normal person is striving to achieve some goal and in so doing is sure to encounter certain obstacles and interferences. The methods which he uses in meeting these frustrating situations are characteristic of his particular personality organization and level of adjustment.⁷⁹ He may, for example, use indirect and evasive approaches corresponding to the escape and defense mechanisms which we have just described. On the other hand, he may employ more direct attacks to overcome or circumvent the obstacle and allow him to proceed toward his goal. This latter approach is what we call *good* adjustment, because it provides relief from inner tension and at the same time secures for the individual the social approval which he is seeking.

SUMMARY

The term "personality" is used widely, although it is one of the most difficult concepts in the field of psychology. It is not an entity, but rather a convenient abstraction by which we describe the unique way in which an individual's various traits are functionally related.

Little progress was made in the scientific study of personality before 1920, and since 1939 Gestalt psychology has contributed most to our knowledge.

There are two general approaches to the study of personality. One analyzes it into its fundamental traits or factors; the other emphasizes its wholeness.

It is doubtful if the newborn baby has a personality in the generally accepted sense of the term. He does possess, however, the raw materials from which personality will develop. Studies indicate that certain phases of personality growth are more constant than others. Those traits which have a physiological basis appear to vary less than those resulting primarily from social experience.

The family group has greater influence upon personality development than any other cultural agency. The Fels Research Foundation has discovered that many parents in their relationships with children can be classified under one or another of seven different categories.

⁷⁹ Seashore and Jensen, *op. cit.*

From the standpoint of the child's personality development, the "acceptant-democratic" home most nearly approaches the ideal.

In some families the child is made to feel unwanted or rejected, and the effects of this attitude often are far-reaching and significant.

Even in the same economic class, different families emphasize quite different sets of values. On the whole, however, school marks and manners are stressed most in middle-class homes.

In general, middle-class mothers inhibit the activities of their children more than do mothers from the lower classes. As a consequence, lower-class children meet fewer frustrating situations, develop a greater sense of freedom and independence, and probably are less tense than are children from the middle classes.

Rivalry among brothers and sisters may have a permanent effect upon personality development. This is true, particularly, if a child feels that he is being displaced in his parents' affections, or if one child is given too much authority over the others.

The conflict between Old and New World standards frequently is a crucial factor in the adjustment of children reared in foreign homes. Moving from one section of the country to another and adapting to various regional social codes also have important effects upon personality development.

The urge to become independent in thought and behavior asserts itself at different levels in the growing-up process. This desire for independence is the basis for many of the criticisms which adolescents make of their parents.

An individual's name may be a source of pride or ridicule in his social relationships, and hence may help or hinder his personality adjustment.

Next to the home, the school probably has the greatest influence upon the growth of personality. Only within recent years, however, have systematic attempts been made to evaluate teacher-pupil relationships. Dominating or integrating behavior on the part of the teacher has been shown to have a definite effect upon the reactions of pupils. The dominating teacher provokes more conflict and is less efficient than is the integrating teacher.

Another interesting angle of the teacher-pupil relationship is found in a survey of traits liked and disliked in teachers by 10,000 high school seniors. It is evident from the results that teachers' personalities have a definite influence upon those of adolescents.

Many adults do not understand the noise and more overt types of behavior characteristic of children. This is true especially of teachers, who are more concerned with behavior which upsets classroom routine than with that which is more serious from a mental hygiene standpoint.

In general, teachers who have more classroom difficulties are those who adopt a "punitive" attitude, and deal with symptoms rather than with causes.

Personality may be evaluated according to two points of view: (1) atomistic and (2) global. Atomistic measurements include: various types of rating scales, questionnaires and inventories; and trait identification, such as the "Guess Who Technique." The global approach makes use of projective techniques, such as: play therapy; easel and finger painting; standardized ink blots; and pictures.

In trying to achieve social adjustment children and adolescents sometimes resort to artificial mechanisms such as overcompensation, projection, rationalization, identification, daydreaming, and feigned illness. Such mechanisms may not be harmful in a moderate degree, but if they become exaggerated they may result in serious personality problems. Providing opportunities for social contacts and self-expression, which will result in a balance between what the individual thinks of himself and what others think of him, will aid materially in preventing such problems.

Every normal person is striving for some goal or goals, and the methods he uses in meeting the frustrations which he encounters are indicative of his personality organization and level of adjustment.

Moral character and religious experience are vital phases of development and are so important that they will be considered separately in the chapter which follows.

SUGGESTED ACTIVITIES

1. Report to the class, withholding names, some instance you know in which an individual has had his personality affected either by being reared in a foreign home or by moving from one section of this country to another.
2. Tell the class about anyone you know whose personality has been influenced because he has an unusual name.
3. Check your parents according to the Fels Rating Scale, and determine to which category, if any, they belong. Explain in detail. Consult reference number 2.

4. Write a brief sketch of the teacher who had the greatest influence upon your personality development.
5. Secure permission to observe in an elementary school, and note instances of teachers whom you consider to be dominating or integrating, and explain why. (It is assumed, of course, that this matter will be considered confidential.)
6. Ask your instructor to administer to the class one of the personality inventories mentioned in this chapter. Score and interpret it, noting your strong and weak points.
7. Appoint a committee to adapt and administer the "Guess Who Technique" to your class, and summarize and discuss the results.
8. Ask your instructor to arrange for a showing of the film entitled *This Is Robert* (by Mary S. Fisher and Lawrence J. Stone, New York University Film Library, 71 Washington Square South, New York 12, New York). Observe particularly how the child's personality changes as he grows older, and note the different projective techniques which are demonstrated.

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CHAPTER 12

GROWTH OF CHARACTER AND RELIGIOUS EXPERIENCE

WHAT IS CHARACTER?

In the preceding chapter we have considered personality as the unique way in which all an individual's traits and tendencies function as an integrated whole. It is difficult to make a sharp distinction between personality on the one hand and character on the other. Customarily, however, the term "character" is used to designate the moral and ethical aspects of behavior. Some writers feel that the term "personality" should be all-inclusive, and that a *good* personality also embodies adequate moral behavior. We are in general agreement with this point of view, and recognize that there is much overlapping between personal, social, and moral traits. Our reason for treating them separately is that we believe such a procedure makes for greater clarity and definiteness. In the present chapter, therefore, we shall adhere to a definition of character which restricts it primarily to the moral aspects of behavior.

We may think of character as being derived from two principal sources. The first of these represents the extent to which an individual conforms or does not conform to the standards of right and wrong set up by society. The second is concerned chiefly with the motive or motives underlying the individual's reactions in a moral situation. Mere conformity, of course, does not represent character in the full sense of the term. Many of the great men and women in history have been distinguished for their lack of conformity to cur-

rent standards, or for their active protests against such standards and their efforts to change them. It is not enough, therefore, to know whether a person is honest or dishonest, selfish or unselfish, cooperative or antagonistic, responsible or irresponsible under certain conditions. We must seek to understand the basic reasons which cause him to act as he does. The motivation of moral behavior is extremely complex and involves many factors. In the long run, however, one's *true* character is a reflection of the particular set of values which he has adopted, and which determine the goals toward which he is striving. These values arise from innumerable sources and are conditioned largely by an individual's experience and social background.

HOW CHARACTER DEVELOPS

There is a widespread belief that children are born with a "conscience" which enables them to distinguish right from wrong, and that even specific moral traits, like honesty and truthfulness, are inherited. This is a convenient concept for parents and teachers, since it relieves them of much responsibility. Obviously, if children are equipped with some mysterious power which enables them to distinguish good conduct from bad, there is no need for adult guidance in moral problems. According to this view, also, undesirable behavior is the result not of parental failure to establish acceptable habits and attitudes in their children but rather of some innate defect which cannot be avoided.

Objective studies of children's moral and ethical concepts, however, fail to support the idea of an innate power of moral discrimination.¹ They suggest rather that what we think of as "conscience" consists of a set of generalizations drawn from specific experiences. The small child, for example, encounters many situations where his behavior meets with either approval or disapproval. As he becomes more mature he begins to grasp the common elements in these different situations and thus builds up generalized concepts of "good" and "bad." These concepts serve as the basis for ideals which, during adolescence and youth, are a very important element in character development. It is felt by some that the significance of ideals has been overstressed, because of the wide discrepancy which often

¹ V. Jones, "Children's Morals," in C. Murchison (ed.), *A Handbook of Child Psychology* (Clark University Press, Worcester, Mass., rev. ed., 1933), p. 506.

exists between them and actual conduct. Granted that this frequently is the case, it is true, nevertheless, that ideals do serve as sources of character motivation by providing a goal for the individual to work toward, even if he does not always attain it.

From a genetic standpoint the character responses of young children are mostly confined to the functioning of specific habits. These are acquired largely through learning in the same way as are other attitudes, knowledges, and skills. The process of generalization described above evolves slowly and does not manifest itself suddenly at any given age level. This means that, despite popular belief, there is no "age of discretion" at which an individual becomes able to discriminate right from wrong, regardless of the situation involved. We do find, however, that with increasing maturity greater and greater use is made of generalized moral concepts. Nor does adulthood necessarily bring a termination of character development. Changing social and economic conditions often make the application of old generalizations to new types of situations impossible, and the person must revise his standards and values accordingly.² The general growth of character is affected profoundly by a number of factors. It was seen in Chapter 7 that the ability to generalize is one of the most important aspects of intelligent behavior. As we should expect, therefore, inferior intelligence retards the growth of character by limiting the individual's ability to develop moral concepts. Low intelligence makes it difficult, also, for the child or adult to foresee the outcomes of his immediate behavior and to work for goals which are relatively distant or abstract in nature.

When one considers the different moral standards which our society imposes upon the two sexes, few, if any, consistent sex differences in character development have been found to exist. Girls seem to be slightly more amenable to training in citizenship than are boys. It has been shown, too, that delinquency is not so common among girls, which may be due to the fact that they generally are less aggressive.³

Emotional conditioning may play an important part in character development. Many parents and teachers seek to inhibit what they

² V. Jones, "Character Development in Children—An Objective Approach," in L. Carmichael (ed.), *Manual of Child Psychology*, chap. 14, especially pp. 707-709.

³ *Ibid.*, pp. 720-722.

consider to be undesirable behavior in children by associating it with fear. Although such a procedure may bring immediate results, it probably has an adverse effect upon character growth from a long-range point of view. Some fears are necessary for protection, but too many block activity. It is believed now that the moral person is not the one who *refrains* from doing things because he is afraid, but rather the one who finds emotional satisfaction in constructive moral behavior.

The importance of social class in all phases of growth has been mentioned repeatedly in previous chapters. There probably is no clearer instance of its operation than in the field of character development. Standards of the lower social classes are so totally different from those of the middle and upper classes that it would be unfair to judge the behavior of an individual from one social level by the values and mores of another. In judging conduct, therefore, we must consider not only the individual's intelligence, family background, opportunities for learning, etc., but also the social class in which he is being or has been reared.

Character, then, is not a static entity like an inborn conscience. It is rather a dynamic quality resulting from the progressive integration and interpretation of a multitude of experiences. Although it is undoubtedly affected by factors which are largely innate, such as intelligence, it is primarily a product of environment. As such it places a heavy responsibility upon the home, the school, and the church as well as upon other agencies for its development. The experiences of early childhood admittedly are of the greatest importance in the molding of character, but we must not forget that the environmental conditions surrounding adolescents and youth also are extremely significant in determining moral conduct. Research has shown that much juvenile delinquency is traceable to poor home conditions, school maladjustments, and lack of community facilities for supervised recreation.

HOW ARE CHARACTER TRAITS AND MORAL ATTITUDES MEASURED?

The measurement of moral traits and attitudes has been undertaken in two general ways. In the first of these the individual is placed in a situation where a moral choice must be made, and his actual behavior is noted. The second approach seeks to evaluate

character through the appraisal of an individual's moral attitudes. The tests employed, usually of the paper-and-pencil type, contain a number of statements embodying various moral attitudes, and the subject is asked to check those which most nearly represent his own values and convictions.

The first method has been used most extensively with younger children, whereas attitude scales have been employed widely with adolescents and adults. One of the first attempts to measure children's "trustworthy" behavior in *real* situations was made by Voelker in 1921.⁴ Similar and improved studies on a more extensive scale appeared somewhat later, and from 1924 to 1929 a very elaborate investigation⁵ was undertaken at Teachers College, Columbia University.

It was the purpose of this survey to evaluate, if possible, the outcomes of ordinary religious and ethical instruction of children by means of tests devised to measure their motives and actual behavior under certain standard conditions. For example, when "trustworthiness" was to be measured, the child was confronted with situations where he might accept credit for knowing certain facts of which he was ignorant; where he might cheat in marking his paper; where he could "peek" in doing a task in which he was supposed to have his eyes closed; where he could accept over-change without knowing that he might be found out; or where he could accept aid in solving puzzles after promising on his honor not to receive any help.⁶

The following is an illustration of an Overstatement Test devised by Raubenheimer⁷ and used in Terman's California study of a thousand gifted children. The child was given a list of 50 titles referring to different books, twenty of which were fictitious. He was supposed to mark those which he had read, his score being the number of fictitious ones checked.

In order to ascertain a child's knowledge of certain items, he was asked to answer questions such as:⁸

⁴ P. F. Voelker, *The Function of Ideals and Attitudes in Social Education* (Teachers College, Columbia University, New York, 1921).

⁵ H. Hartshorne and M. A. May, *Studies in Service and Self-Control* (The Macmillan Company, New York, 1929), Vol. II.

⁶ *Ibid.*

⁷ L. M. Terman et al., *Genetic Studies of Genius* (Stanford University Press, Stanford, Calif., 2nd ed., 1926), Vol. I, p. 489.

⁸ Reprinted from *Genetic Studies of Genius*, Volume I, by Lewis M. Terman with the permission of the author and of the publishers, Stanford University Press.

Do you know who discovered America?
 Do you know who wrote *Huckleberry Finn*?
 Do you know who was the prophet who spent the night in the lion's den?
 Do you know how to find the square root of decimals?
 Do you know where Calcutta is?

The child was then asked to mark the best answer to such items as:

America was discovered by
 Drake Columbus Balboa Cook

Huckleberry Finn was written by
 Alger Dickens Henty Mark Twain

The prophet who spent the night in the lion's den was
 Daniel Jonah David Joel

The square root of .0081 is
 .9 .09 .009 9

Calcutta is in
 India Egypt Siberia Mexico

His score was based upon the amount of agreement between his professed knowledge and his actual information.

A scale which reveals motives may be illustrated by Raubenheimer's test on "Social Attitudes".⁹ The child is marked on the number of questionable items he selects in telling how he feels about some thing or idea. Following are three out of the 24 items given in the scale:

Chums

- It is hard to go without them.
- You cannot always trust them.
- They sometimes squeal on you.
- It is best to have them in your gang.

Teachers

- They work hard.
- They know they can punish you.
- They are not fair to you.
- They are kind of cranky.

Having a Paper Route

- It gives you a chance to get away from home.
- You can earn some money.

⁹ Reprinted from *Genetic Studies of Genius*, Volume I, with the permission of the author and of the publishers, Stanford University Press.

- You have a chance to get around town alone.
..... You don't have to be so much with your lessons.

Another interesting type of test required the child to place numbers from 1 to 8 before certain descriptions of boys to show how well he would like to have them for chums. The following two are representative:¹⁰

Dick joined the Boy Scouts as soon as he was old enough. He did not like it at first, the drill and the rules were hard. Now he is a troop leader and is planning a camp in the mountains next summer.

Ray Stevens is at school now, but he is anxious to get out. He wants to become a taxi-driver. Ray says that taxi-drivers have an easy time; they need not work so hard, and they go about a great deal.

The forms of specific moral behavior investigated at Columbia included "honesty and deceit," "cooperative and charitable behavior," and "self-control," the latter involving "persistence" and "inhibition."¹¹

When honesty was being measured the child was given a paper containing ten circles of different sizes, placed in various positions. At a given signal he was to shut his eyes and write certain numbers in as many of them as possible. The average of five trials constituted the score. This was compared with the average of those known not to have cheated. If the child's score was higher, it was then regarded as evidence of "peeking" or cheating. Some of the tests of "trustworthiness" previously described were also used, either in the same form or slightly modified.

Coöperation and charitable behavior were evaluated by situations wherein the subject was asked to give up something he treasured to children less fortunate than he. Thus, he was afforded the opportunity of going without ice cream for dessert, which he had but rarely, or of donating *all* or *part* of an attractive gift kit containing articles prized by most children, an "eraser," "folding drinking cup," "ruler," "pencils," "pencil sharpener," "pen points," or "pen holders." The scoring was dependent upon the value which the children placed upon the articles. Giving away a pen, for example, was scored two points, but an eraser rated five points, because it was more difficult

¹⁰ Reprinted from *Genetic Studies of Genius*, Volume I, with the permission of the author and of the publishers, Stanford University Press.

¹¹ Hartshorne and May, *op. cit.*

to obtain. Those who disposed of old erasers, pencils, and the like, while retaining the new, received low scores.

Offering services to others was also evaluated. The children were asked to make scrapbooks or mend toys for poor children by coming early to school, their scores being based upon their regularity and promptness. Working arithmetic problems for one's own glory or for the achievement of the class as a whole constituted a test of service and unselfishness.

Self-control was judged by the amount of inhibition which the child exhibited, or by his persistence in finishing unpleasant or tedious tasks when attractive distractions were offered. To measure inhibition the child was given several pieces of candy and was told that he might eat them if he so desired, but that the examiner preferred him not to do so. His score was the number of pieces eaten before the end of the tests. A bad-smelling substance was put under the child's nose and he was told to "keep a wooden face." Any change in facial expression was scored against him.

In order to judge persistence, such tests were given as determining how long the child would hunt for pennies or ball bearings dropped on the floor, and the total number found, how long he could stand on one foot without leaning against an object, touching the foot to the floor, or losing his balance; the length of time he would work at a puzzle in order to obtain a dime, which was the reward for the correct solution; or how well he could whistle with a cracker in his mouth without taking a drink of water, which he was supposed not to accept.

It must be admitted that this research has been limited to the measurement of only a few traits, and although the tests are ingenious, they are too elaborate for practical purposes. However, the results¹² of these and other investigations of groups of school-age children provide additional evidence of the importance of intelligence as a factor in moral behavior. In the California survey from 60 to 80 percent of the bright children exceeded the average of unselected children in certain tests of moral conduct.¹³ There was evidence, also, that the bright nine-year-old achieved a level of character development commensurate with that attained by ordinary children of 14 years.¹⁴ It has been pointed out, however, that a further analysis of

¹² A good summary will be found in both of the chapters written by Jones.

¹³ Terman, et al., *op. cit.*, p. 516.

¹⁴ *Ibid.*

Terman's findings reveals that in general bright children surpass the average more in traits associated with "self-success" than in those related to social responsibility.¹⁵ Data are available, too, which indicate a greater preponderance of dull children among delinquents than in the population as a whole. This does not mean, of course, that inferior intelligence is a cause of delinquent behavior. It does show that dull children are more likely to become delinquent than are those of average or superior ability. This is due probably to their limited foresight and lack of self-control.¹⁶

Test results tend to support the inference mentioned earlier in this chapter that girls are somewhat superior to boys in the development of certain specific character traits. Sex differences in moral traits, however, are less among normal children than among the gifted. With the gifted, girls are superior, and they "begin their adolescent spurt in character development about a year earlier than the boys."¹⁷ On the inhibition tests the girls were more sensitive to the subtle aspects of the situation, whereas the boys were influenced by its more obvious features.

Character tests show, also, that the teacher and the class morale have a decided influence upon specific moral traits. This is true especially with respect to cheating. Thus, a child who will cheat in a class where he considers the teacher to be unfair will not do so in a situation where he feels that the teacher is just and considerate. Similarly, there usually is little cheating in a class where group morale is high, and the teacher is liked and respected.

Brothers and sisters are more alike in self-control and service than they are in deception. Common interests rather than cultural and economic factors probably account for the close resemblance between friends and between brothers and sisters on tests of persistence.

The influence of associates upon moral behavior is very great, ranking second among the factors affecting character growth. As we saw in Chapter 10, the gang exerts a marked influence upon the actions of its members, but some studies indicate that smaller and more intimate groupings, sometimes within the gang itself, have even greater significance.

Home background and parental control are admittedly the most

¹⁵ Jones, in Carmichael's *Manual*, pp. 715-716.

¹⁶ *Ibid*, pp. 714-715.

¹⁷ Terman et al., *op cit.*, p. 517.

important factors in the child's moral development.¹⁸ Test findings show that the mother exerts a greater influence upon the child than does the father.¹⁹ As would be expected, poor home conditions and broken homes have an adverse effect on character development.

Contrary to what many people believe, the Columbia University survey indicated that attendance at Sunday School has little or no effect upon character development, and that the influence of the Sunday School teacher was negligible. There was no positive relationship either between a child's knowledge of the Bible and his moral conduct.

The question as to how consistent individuals are in their moral behavior is one about which there has been much discussion.²⁰ For example, if a person is honest in one type of situation, will he be equally so in all other similar situations, or does honesty vary with the circumstances? Some writers believe that moral traits are highly specific and that one can be honest or truthful under one set of conditions without necessarily being so under another. Others think that character traits are more general, affecting the individual's behavior in *all* situations. These general responses are the outcome of the individual's particular goals, which, in turn, are derived from his set of values.

The outcomes of the character tests described above show rather conclusively that behavior in the traits measured is specific, i.e., it varies with the situation. We must bear in mind, however, that the subjects participating in these tests were children whose powers of generalization may not have been developed fully. Much of what appears to be generalized moral response probably is due to the individual's ability to discern the common elements in a number of widely different situations. On the other hand, as we have pointed out previously, the mature person's values do constitute an important motivating factor in character responses. The safest conclusion probably is that moral traits are neither wholly specific nor wholly general.²¹ The ability to do right or wrong arises largely from a number of specific experiences which the child combines into gen-

¹⁸ Jones, in Murchison's *Handbook*

¹⁹ Hartshorne and May, *op. cit.*

²⁰ Read G. W. Allport, "The Ego in Contemporary Psychology," *Psychological Review*, 1943, 50:451-478.

²¹ Jones, "A Comparison of Certain Measures of Honesty at Early Adolescence with Honesty in Adulthood—A Follow-Up Study," *American Psychologist*, 1946, 1:261.

eral principles with advancing maturity. In addition, he comes eventually to adopt a certain set of values and goals which serve to guide the choices he makes in a moral situation.

Another interesting problem in this connection is the extent to which the character traits of late childhood persist into adult life. In 1944 Jones²² made a follow-up study of 304 boys and girls who had been given five tests of cheating in 1932 when they were in grades 7 and 8. Although 33 percent of the adults failed to qualify as honest, 75 percent of those who had rated in the upper third in honesty as adolescents continued to be honest 12 years later. Jones thinks that these results do not support the notion either of complete specificity or of complete generality in honesty. They suggest, rather, that honesty results from the progressive development and organization of the individual's motives and goals. By adolescence this organization of experience has proceeded to the point where there is likely to be little change in the adult years.

Typical of the numerous paper-and-pencil techniques which have been employed to evaluate character traits is the study made by Whitlow²³ of a representative group of high school boys and girls. A check list of behavior traits was given to the students, and they were asked to check first those which they considered to be most serious. They were then requested to indicate which of these kinds of behavior they indulged in most frequently. Results showed that stealing, drinking, and lying were rated as the worst offenses, and that swearing, disobedience, and lying were confessed to most frequently. Little relationship was found between professed moral attitudes and actual behavior. Girls, however, seem to be controlled more by attitudes than are boys. The author concluded that the school has little effect on either attitudes or behavior of adolescents. It should be noted that items concerning sex were not included in this study.

In an attempt to determine the differences in moral standards between college men and women, Skaggs²⁴ gave a list of 20 items representing different kinds of behavior to 208 men and 208 women enrolled at Wayne University in Detroit. They were asked to rate the moral seriousness of each item from zero, or "no moral implication,"

²² *Ibid.*

²³ C. M. Whitlow, "Attitudes and Behavior of High School Students," *American Journal of Sociology*, 1934, 40:489-494.

²⁴ E. B. Skaggs, "Sex Differences in Moral Attitudes," *Journal of Social Psychology*, 1940, 11:3-10.

to 10, which was "most serious, wicked, or sinful." The results are as follows:

MORAL RATINGS MADE BY COLLEGE STUDENTS²⁵
(Medians)

| Act Judged | Women | Men |
|---------------------------------|-------|-----|
| Rape | 10 | 10 |
| Taking human life | 10 | 10 |
| Extramarital relations | 9 | 5 |
| Petty store stealing | 8 | 7 |
| Love affair with married person | 8 | 7 |
| Selling found book | 7 | 7 |
| Stealing friend's lover | 6 | 6 |
| Cheating on exams | 5 | 5 |
| Drinking parties | 5 | 3 |
| Gambling for money | 4 | 2 |
| Spitting on floor | 4 | 5 |
| Ingratitude | 4 | 5 |
| Selfishness | 4 | 5 |
| Lying to parents | 4 | 5 |
| Use of profanity | 3 | 5 |
| Petting and necking | 3 | 1 |
| Smoking when signs forbid it | 2 | 3 |
| Being an atheist | 0 | 0 |
| Smoking cigarettes | 0 | 0 |
| Flirting | 0 | 1 |

It will be noted that there is a high degree of consistency between the sexes, except on the item concerning extramarital sex relations. Evidently, cheating on examinations is not considered to be very important. Rape, and the taking of human life are rated as most serious, whereas being an atheist, smoking cigarettes, and flirting are believed to have little or no moral significance.

Several years later at the same university three different experiments were conducted in the introductory psychology classes to ascertain the honesty of the students in reporting errors made purposely in grading their examination papers.²⁶ When the students were unaware of the experiment, most of them failed to report errors which were in their favor, but nearly all of them protested those which reduced their scores. After being told about the nature of the

²⁵ Reprinted by permission.

²⁶ W. C. F. Kruger, "Students' Honesty in Correcting Grading Errors," *Journal of Applied Psychology*, 1947, 31:533-535.

experiment, however, almost all errors were reported whether they were to the student's advantage or not. This reversal of the situation was due probably to the fact that the students felt their honesty was at stake.

Other studies concerning the honesty of students on examinations have been conducted elsewhere with substantially the same results. They indicate, also, that, as one might expect, poor students are more likely to cheat than are those whose work is superior. Among older individuals, the knowledge that behavior will be found out evidently has a marked effect upon the quality of moral conduct.

SOURCES OF RELIGIOUS EXPERIENCE

As in the case of character, the belief is widespread, especially among theologians, that there is an innate "religious instinct." According to this view the child is naturally religious and, if given proper opportunities, will develop meaningful and adequate religious concepts. It is held that the child from an early age is aware instinctively of a "Higher Power" to which he naturally turns for protection and toward which he has an innate attitude of reverence and worship. This view hardly seems consistent with the so-called doctrine of original sin still current in many theologies, which claims that a child's innate tendencies are evil because he inherits the original sin committed by Adam in the Garden of Eden. This means that all natural child activity, all childish interests and desires are symptoms of an inherently evil nature. Play is interpreted as an evidence of a sinful disposition, and it is considered necessary to use the sternest possible discipline in order to suppress these evil tendencies and to guide the child along the path to righteousness. Only through the formal acceptance of salvation, as provided by the church, can the individual hope to escape eternal damnation.

Such objective evidence as is available fails to support the theory of an instinctive basis for religion. Children, left to themselves, do not seem to be conscious of the existence of any "*Higher Power*." Many older children do not seem to have had any particular feeling of reverence, although some claim to have had such an experience.

It is difficult for those who know children intimately to believe in the rather stern doctrine of original sin. Many progressive theologians now reject the view that child nature is inherently evil. They believe

instead that children are born neither good nor evil, but rather with potentialities which society may direct into either good or evil channels.

The beginnings of formal religion probably go back farther than the origin of relatively modern theological doctrines. Wonder and curiosity about the universe in which he lived led primitive man to formulate theories to explain natural phenomena such as the seasons, thunder, rain, and the like. Since he had no knowledge of natural laws, or of simple causal relationships, he ascribed these phenomena to supernatural forces. In order to placate these forces and to win their support, primitive man developed a body of ceremonies and rituals which were transmitted from generation to generation as religion. The moral implications of religion, however, developed very slowly and did not attain their full significance until the rise of Christianity.²⁷

Thus religion appears to have had its origin in the curiosity accompanying man's intellectual development rather than in a special instinct. Furthermore, religious beliefs have changed as man has advanced intellectually, although in many instances they have not kept pace with modern progress.

HOW RELIGIOUS IDEAS DEVELOP IN CHILDREN AND YOUTH

Children who have been brought up under the influences of traditional religious instruction seem to have not only confused but also absurd and meaningless ideas about God, heaven, and hell, as has been shown by numerous surveys. As early as 1880 G. Stanley Hall, in his famous study, *The Contents of Children's Minds*,²⁸ asked questions designed to reveal the child's religious concepts. The following represent some of the replies as to the nature of God, heaven, and hell:²⁹

God is a big, perhaps *blue man*, very often seen in the sky, on or in the clouds, in the church, and even street. . . . He makes lamps, babies, dogs, trees, money, etc., and the angels *work for him*.

²⁷ For an interesting account of the development of morality and religion, read J. H. Breasted, *The Dawn of Conscience*.

²⁸ G. S. Hall, *The Contents of Children's Minds on Entering School* (E. I. Kellogg, New York and Chicago, 1893).

²⁹ *Ibid.*, pp. 39-40.

When people die they just *go* or are *put in a hole*, or a box or a black wagon *that goes to Heaven*, or they *fly up* or are *drawn* or *slung up* into the sky where God *catches* them.

When children get there [Heaven] they have candy, rocking-horses, guns, and everything in the toy shop or picture book, play marbles, tops, ball, cards, hookey, hear brass bands, have nice clothes, gold watches and pets, ice-cream and soda water, and no school.

The bad place is like an *oven* or a *police station*, where it burns yet is all dark, and folks want to get back and God *kills* people or *beats them with a cane*

An unpublished study made by the present writers of rural and city elementary school children also reveals jumbled ideas about religion. God and Jesus are frequently confused, and most of the concepts of God are of a personal nature. Thus, He is appealed to for food, clothing, toys, etc. Heaven is regarded as a definite place of beauty either in the ground or in the sky. One six-year-old girl thought it was a creek, and a boy of nine claimed it was "smoke, water, and air." Jesus is regarded as a Protector: "takes you to Heaven if you're good"; "makes you well when you're sick"; and a seven-year-old girl maintained that "He [Jesus] made candy."

More recently, children participating in a "Child's World" broadcast showed the same misunderstandings in their ideas about God.³⁰ A 12-year-old altar boy said he first thought God was someone with "just His head and shoulders sticking out of the clouds." Another boy thought that God was "someone up in Heaven that was supposed to take care of everything and patch up everything, so there wouldn't be any bad feelings between people." He added later that God was "a pretty swell guy who could do most anything." Still another child was puzzled by "the way He [God] made everything from nothing."

These responses reflect not only the misunderstandings of children but also the distorted theological beliefs taught them by uncritical elders. Obviously, a major cause of the religious misconceptions exhibited by children is their tendency to reduce all ideas to concrete terms within the scope of their experience. From this standpoint it seems questionable if an attempt should be made to teach young

³⁰ "Child's World: New Program Airs Juvenile Ideas on God, Jealousy, Death," *Life*, August 2, 1948, 25:79-83.

children the standard theological concepts of Christianity.³¹ Many parents feel that it is their duty to instill religious ideas into children regardless of their age or intellectual maturity. Evidently such premature instruction confuses children and may be the source of serious conflict around adolescence.

In a recent questionnaire survey³² of 547 prepubescent, pubescent, and postpubescent pupils, it was found that many of the specific beliefs which were taught to them as young children are no longer held in the late teens. This is due probably to greater intellectual maturity, which makes them more sensitive to the inconsistencies of their early beliefs. Their increased powers of generalization make it possible, also, for them to substitute more abstract and general concepts for the naive, concrete ones of childhood. Obviously, individual differences in intellectual development will bring about corresponding differences in maturity of religious thinking.

Contrary to what many people believe, there seem to be very few atheists among high school or college students.³³ According to one study the height of religious doubt occurred in the teens, but there often was a return to greater interest in religion later on. There is evidence, however, of a strong trend toward religious humanism at the college level.³⁴ This point of view emphasizes man's ability to create a good life without supernatural aid, and the importance of ethical responsibility. It regards God not so much as a person, but rather as the spirit underlying constructive human relationships.

The question of prayer presents many difficulties for small children. They tend to pray for concrete things and often are disappointed if they fail to receive them. Parents occasionally "answer" children's prayers by giving them the things for which they ask. Although this may maintain the child's faith temporarily, it is almost certain to lead eventually to a point where his demands can no longer be satisfied. As has been said so aptly, "Prayer at its worst has de-

³¹ H. E. Fosdick, "Teaching Your Child Religion," *World's Work*, 1929, 58:52-56, 112, 118.

³² R. G. Kuhlen and M. Arnold, "Age Differences in Religious Beliefs and Problems During Adolescence," *Journal of Genetic Psychology*, 1944, 65:291-300.

³³ A. R. Gilliland, "The Attitude of College Students Toward God and the Church," *Journal of Social Psychology*, 1940, 11:11-18.

³⁴ G. W. Allport, G. M. Gillespie, and J. Young, "The Religion of the Post-war College Student," *Journal of Psychology*, 1948, 25:3-33

generated into a begging ritual."³⁵ Some of the standard prayers taught children are undesirable, also, because they make him fear that death might ensue during the night, as in the case of "If I should die before I wake." Progressive religious leaders suggest that the young child be introduced to prayer by having him talk over the day's happenings with his parents at bedtime.³⁶ It is suggested that he be led gradually to reflect upon his own conduct and to recognize for himself how his behavior could be improved. This serves as the basis for meditation, which, in more mature years, is recognized as being the primary value of prayer.

HOW IDEAS OF LIFE, DEATH, AND IMMORTALITY DEVELOP

A small child has some difficulty in distinguishing living from non-living objects. He tends to be animistic, that is, to endow inanimate objects with life. Within recent years there has been considerable research upon the problem of child animism.³⁷ Children in different cultures have been given words denoting various objects and have been asked to indicate whether they are dead or alive, as, for example: "knife, mirror, stone, broken button, comb, broken dish. . . ."³⁸

Piaget believed that animism followed four definite stages of development representing specific age levels.³⁹ In the first stage anything is considered "living" which is of some use or is in good condition, i.e., it is not damaged or broken in any respect. Thus, a broken whistle is not alive. In the second stage anything that moves is considered to be alive, e.g., the wind. In the third stage the child distinguishes between spontaneous movement and movement imposed by an outside agent, and identifies life with spontaneous movement. For example, an automobile might be classified as alive, whereas a child's wagon

³⁵ E. M. Manwell and S. L. Fahs, *Consider the Children—How They Grow*, p. 204.

³⁶ *Ibid.*, chap. 13, also H. W. Fox, *The Child's Approach to Religion*, p. 36; and M. H. Bro, *When Children Ask*, pp. 70-76.

³⁷ See articles by R. W. Russell and W. Dennis, also M. Bruce, "Animism vs. Evolution of the Concept 'Alive,'" *Journal of Psychology*, 1941, 12:81-90.

³⁸ W. Dennis, "Animism and Related Tendencies in Hopi Children," *Journal of Abnormal and Social Psychology*, 1943, 38:21-36.

³⁹ For a criticism of Piaget's views read R. W. Russell, "Studies in Animism: II. The Development of Animism," *Journal of Genetic Psychology*, 1940, 56:353-366.

would not, because it requires someone to push it. In the final or adult stage life is restricted to animals or plants, but usually to animals alone.

In general it has been found that these stages in animism are true, despite differences in sex, geographical location, and socioeconomic status.⁴⁰ Extreme cultural variations, however, do affect the degree of animism. Hopi Indian children, for instance, are more animistic than are whites. This has been attributed to the fact that in Hopi culture more emphasis is placed upon magical and supernatural and less upon naturalistic explanations.⁴¹

There is, however, great overlapping of the ages at which different stages of animism occur. A child's ideas in this respect seem to be related more closely to his intellectual maturity than to his chronological age. This is shown by the case of a girl with an I.Q. of 150 who achieved the adult stage in animism at the age of six years and two months.⁴²

Closely allied to the problem of animism is that of the child's conception of death. Despite its importance, psychologists have failed to investigate extensively ideas of death from the genetic point of view. A recent study made in Budapest⁴³ tried to determine the ideas and theories of death held by 378 children 3 to 10 years of age. They were evenly divided on the basis of sex and represented various religious groups, social levels, and kinds of schools. The methods varied with the age of the children, but in general they included the analysis of ideas expressed in written compositions, drawings, and individual conferences. Such questions were asked as:

What is death?
 Why do people die?
 How can one recognize death?
 Do you usually dream?
 Tell me a dream about death.

⁴⁰ *Ibid*, pp. 364-365; I. Huang and H. W. Lee, "Experimental Analysis of Child Animism," *Journal of Genetic Psychology*, 1945, 66 69-74, Russell, "Studies in Animism V. Animism in Older Children," *Journal of Genetic Psychology*, 1942, 60-329-335.

⁴¹ Dennis, *op. cit.*

⁴² Dennis, "Piaget's Questions Applied to a Child of Known Environment," *Journal of Genetic Psychology*, 1942, 60.307-320.

⁴³ M. Nagy, "The Child's Theories Concerning Death," *Journal of Genetic Psychology*, 1948, 73.3-27.

The results indicated that children's ideas of death may be classified into three fairly distinct stages. The child under five does not accept the idea of death. To him dying is a departure—a sleep. Later, it is a further existence in changed circumstances.

Between the ages of five and nine the child recognizes himself as a living being. He personifies death in two ways: (1) as the Reaper, a separate invisible person, and (2) as identified with any dead person.

After the age of nine death is recognized as the cessation of bodily life. There comes an awareness that death is universal and that the body dies while the soul lives on.

A somewhat earlier study was made by Anthony⁴⁴ on 117 English children from both ordinary and special schools. Her problem was to ascertain what death means to children and how they discover it. She found that the small child discovers death spontaneously and looks upon it as separation or loneliness. In his imagination he often thinks of death as the outcome of "aggression, violation, or robbery." He may experience a feeling of guilt if someone dies to whom he has been unkind.

The years seven and eight are crucial in the development of the child's ideas of death.⁴⁵ They mark the shifting from a lack of understanding of its significance to the recognition of its universality and its inevitability. Genetically, the child's concept of death follows the stages in casual thinking outlined by Piaget, which we referred to in Chapter 8.

There is little agreement as to what explanation should be given to children when death actually occurs in the family. Even though the child may look upon death as a departure, it does not seem wise to tell him that the person who died has gone on a long trip. Such an explanation does not offer any security, and the child will watch constantly for the deceased person's return. It has been suggested that the child be told that one who has died has no pain and is gone permanently, but that we can remember our pleasant associations with him. In the final analysis, of course, what a child is told about death will depend upon the social status, religious beliefs, and per-

⁴⁴ S. Anthony, *The Child's Discovery of Death (A Study in Child Psychology)* (Harcourt, Brace and Company, New York, 1940).

⁴⁵ *Ibid.*, p. 86.

sonal philosophy of his parents and others with whom he comes in contact.⁴⁶

The mystery of what happens to an individual after death is still a problem at adolescence. In fact, wondering about this question increases between 15 and 18 years.⁴⁷ College students apparently do not often think about death as being associated with themselves. Some of them, however, avoid funerals and other situations where death is present.⁴⁸

It has been suggested that the concept of immortality has been developed as man's sole defense against the idea of complete annihilation implicit in death.⁴⁹ According to some writers this is an evidence of emotional immaturity. What the human being should do is to face squarely the inevitability and finality of death, and to emphasize the permanent contribution to society which every individual can make, rather than the notion of personal survival. Other writers believe that, although immortality can never be more than a hope, it is, nevertheless, a good thing to hold such a hope, because it gives greater significance to one's efforts and provides an ideal goal toward which to work.⁵⁰

HOW SHALL RELIGIOUS IDEAS BE PRESENTED TO CHILDREN AND YOUTH?

One of the major problems encountered by religious educators is to arouse and maintain the interest of children and young people in church services and activities. Despite the efforts of progressive churches to make religious teachings more challenging, statistics show that there is a decrease in Sunday School and church attendance as children grow older.⁵¹ Boys drop out faster than do girls, and their attendance is less regular. Disliking church services, also, was shown to be one of the three major problems which increased with age from the prepubescent through the postpubescent years. Nimkoff

⁴⁶ Consult Bro, *op. cit.*; Fox, *op. cit.*; and Manwell and Fahs, *op. cit.*, chap. 11.

⁴⁷ Consult Kuhlen and Arnold, *op. cit.*

⁴⁸ Quoted by Anthony, *op. cit.*, pp. 64-65.

⁴⁹ M. C. Otto, *The Human Enterprise* (Appleton-Century-Crofts, Inc., New York, 1940), chap. 11.

⁵⁰ R. B. Perry, *The Hope for Immortality* (The Vanguard Press, New York, 1945).

⁵¹ M. F. Nimkoff, *The Child* (J. B. Lippincott Company, Philadelphia, 1934), pp. 282-283.

suggests three possible reasons for this irregularity and nonattendance: (1) failure of parents to attend; (2) lack of interesting services; and (3) coercing the child to go.⁵²

This lack of interest is demonstrated in the reasons for and against Sunday School attendance given by a Winfield, Kansas, elementary school pupil:⁵³

Reasons for going.

It is the Christian thing to do.

It will do me some good.

It pleases grandfather

Reasons for not going.

I like to sleep on Sunday morning.

The preacher bores me.

My Sunday pants scratch.

From a boy's point of view the evidence seems to be in favor of the "reasons for not going." These may appear insignificant and even trivial to an adult, but they illustrate the uninterested and vague attitudes toward religious services which seem mainly responsible for the failure of Sunday School and church attendance to influence everyday conduct.

Surveys of the religious attitudes and beliefs of college students indicate that they are not hostile toward the church.⁵⁴ Many of them, however, are sharply critical of institutionalized religion in its present form. They feel that there is too much emphasis upon denominational and doctrinal differences, and not enough upon the social and ethical aspects of religion. Nevertheless, one study of 414 college men and 86 college women showed that only 15 percent of them did not participate at all in any kind of religious activities.⁵⁵ The sex differences in religious interests which appear at an earlier age continue at the college level, the women being more religious than the men.

There is abundant evidence that early religious instruction by both home and church is the most essential factor in the determination of subsequent religious attitudes. The method used in presenting religious concepts to children, therefore, is of the greatest importance.

⁵² *Ibid.*, p. 283.

⁵³ From a press clipping, February 24, 1939.

⁵⁴ Allport, Gillespie, and Young, *op. cit*

⁵⁵ *Ibid.*

In general, two approaches to the problem of religious instruction have been employed. The older of these is known as the evangelistic or formal approach and the more recent method is often referred to as the "life-experience approach."⁵⁶ In the first method the emphasis is upon the teaching of theological concepts and doctrines. As indicated already, there is considerable doubt as to whether or not this approach results in meaningful religious ideas which can be applied to everyday experience. Many formal religious concepts are too abstract and vague for children to grasp, and trying to teach them produces only confusion and misunderstanding. In the second method the development of the spirit of religion through desirable conduct in everyday living is stressed, and so far the results have been very promising.

One of the best examples of the "life-experience" approach to religion is an experiment⁵⁷ conducted at the Union Theological Seminary in New York. Its aim was "to help children to achieve moral growth in all the relationships of life, including their relations to God, to the universe, to other human beings, and to themselves."⁵⁸ The children participating were superior eight-year-olds of better than average socioeconomic status. The teachers provided a varied and challenging program of activities through which the children could develop their own ideas about religion. The center of interest around which all their activities were focused was a history of the universe and a discussion of the origin and evolution of life. No attempt was made to teach any standard concept of God, but the children were left free to formulate their own opinions. In their class discussions and on their nature trips much emphasis was placed upon helpful conduct and responsibility. The children's attention was directed to the consequences and implications of their behavior by such phrases as:

"What had we better do about that?"

"Let's stop and talk this over a few minutes."

"What happened because we did this?"

"What are all the things that might happen if we should do this?"

"I wonder why this was?"

⁵⁶ Dr. Fosdick (*op cit.*) uses the terms "authoritarians" and "experientialists"

⁵⁷ S. L. Fahs and H. F. Sweet, *Exploring Religion with Eight Year Olds* (Harper & Brothers, New York, 1930).

⁵⁸ *Ibid.*, p. 245.

After the group had developed the idea that man's conception of God had changed with advancing civilization, some of the children volunteered the following comments:

"Science hasn't been able to tell us yet how the first life came to be, but we just call it God back of it all. Some day men probably will know. You can't say whether there is a God or isn't, but you can call whatever started life in the world God"⁵⁹

"God isn't a person. He's a great energy back of all the world, or a spirit if you want to call it that, but He isn't a person."⁶⁰

"I think that there surely is a God, after all we've studied. We went right back to the beginning just as our chart shows, and saw how the world began flying off the sun. How could that ever have happened if there hadn't been something behind the world? And that must be God."⁶¹

"Of course, there is a God. He is a great spirit that makes everything grow. Think of a tree coming out of a tiny seed. There must be something that does those wonderful things."⁶²

When asked if they should turn to God in prayer, one child said: "I think it's better to use your head because you always have it with you."⁶³ Another remarked: "God can't really tell us what to do. Maybe He could but He doesn't want to because he wants us to learn for ourselves."⁶⁴

The objection may be raised to this informal type of Sunday School teaching that it provides no systematic instruction in fundamental religious concepts. However, it has the obvious advantage of correlating more closely with life problems and with general approaches to character development, which have already been indicated. Its emphasis upon the growth of general moral and religious concepts through specific experience is in harmony, also, with more modern beliefs concerning the evolution of children's ideals. If, as one writer points out, ideals are generalized habits,⁶⁵ then the formation of desirable habits in real life situations is of primary importance. The approach to religious instruction through activities also has the advantage of arousing and maintaining interest. Such activities, natu-

⁵⁹ *Ibid.*, p. 135.

⁶⁰ *Ibid.*, p. 184.

⁶¹ *Ibid.*, p. 211.

⁶² *Ibid.*, p. 47.

⁶³ *Ibid.*, p. 92.

⁶⁴ *Ibid.*, p. 202.

⁶⁵ F. D. Brooks, *Child Psychology* (Houghton Mifflin Company, Boston, 1937), p. 400.

rally, must be adjusted to the intelligence, social background, and maturity of the children. The average child probably will require a more concrete approach than that used in the experiment just cited.

In this connection modern religious leaders are suggesting that a study of the wonders of nature be used for the appreciative side of religion. It is also recommended that emphasis be placed upon social service activities and upon the importance of parental example and family relationships.⁶⁶ Jesus should be considered as a *real* man who exemplifies those qualities of character and conduct which are universally accepted as most desirable. The child needs religion as a means of self-expression, as an aid in strengthening his sense of security, and as a guide for social living.⁶⁷ With a background which he can comprehend, such as has been indicated, he should be able, when he reaches maturity, to formulate his own interpretation of the more abstract phases of religion.

It has been believed widely that adolescence was always accompanied by a "religious awakening." Recent studies, however, do not confirm this supposition.⁶⁸ They indicate instead that the growth of religious ideas is a gradual process with no spurt necessarily occurring around puberty. In fact, as we have mentioned above, religious interest often is lower during the teens than at any other time. It is interesting, also, to note that the narrower and more formal religious instruction is during childhood, the more likely adolescents are to turn away from religion.

It would be presumptuous to say dogmatically whether the formal or the life-experience approach should be followed exclusively in the guidance of religious development. A great deal will depend upon the parents and their background, upon the type of community in which they live, upon the individual's intelligence, and upon his social and emotional maturity.

Probably most people are still influenced by formal theological doctrine with its emphasis upon the supernatural. Consequently, the transition to more modern techniques of religious education will necessarily be a slow one. Nevertheless, there seems to be a definite trend toward a more informal presentation of religious teachings and

⁶⁶ Fosdick, *op. cit.*

⁶⁷ Nimkoff, *op. cit.*, pp. 285-286.

⁶⁸ H. S. Dimock, *Rediscovering the Adolescent. A Study of Personality Development in Adolescent Boys* (Association Press, New York, 1937), pp. 159, 163; and Kuhlen and Arnold, *op. cit.*

a more sincere attempt to adjust them to the child's level of maturity.⁶⁹

Religion is recognized generally as a necessary factor in an individual's all-round development. In the survey of college men and women referred to previously, 7 out of 10 of the students felt satisfactory religious orientation was essential. Religion can provide a valuable source of motivation, and assist in good adjustment by contributing to the individual's feeling of security and belongingness.⁷⁰ Religion has been defined as "the active practice of one's philosophy of values."⁷¹ It is somewhat more than this, however, because at its best it should help a person to find a satisfactory set of values.⁷² It should also make him feel at home in the universe by causing him to recognize some relationship between his personal ideals and goals and the ongoing processes of nature as a whole.

SUMMARY

Although it is difficult to distinguish sharply between personality and character, the latter has been defined as the moral side of behavior. Character includes both conformity to social standards and the motives underlying conduct.

Despite the widespread belief that children are born with a conscience which enables them to distinguish right from wrong, objective studies of their moral and ethical concepts fail to confirm this. They show rather that moral discrimination is a result of experience and social background.

From a genetic standpoint moral ideas are the results of generalizations from specific habits which are acquired largely through learning in the same way as are other attitudes, knowledges, and skills. The process is gradual, and there does not seem to be any special "age of discretion." Character growth is never static, but changes continually. It is influenced by a number of factors, such as: sex, emotional conditioning, social class, and the type of home, school, and community in which the individual lives.

⁶⁹ D. T. Yoder, "What Shall We Tell Our Children About God?" *School and Society*, 1941, 54:97-100, Fahs, "Religion in the Public Schools—Values at Stake," *Childhood Education*, 1942, 18:245-251.

⁷⁰ H. S. Tuttle, "Religion as Motivation," *Journal of Social Psychology*, 1942, 15:255-264.

⁷¹ A. J. Bahm, "Humanism: A Religion for Scientists," *Scientific Monthly*, 1946, 62:310-315.

⁷² E. S. Brightman, *A Philosophy of Religion*, chap. 3.

The character traits of children have been evaluated by measuring their behavior in actual moral situations. Only a few of the many traits have been investigated, as "trustworthiness," "cooperation and charitable behavior," "self-control," and some social attitudes. On the whole, these tests have been more ingenious than practicable.

The results of such tests indicate that bright children are in advance of average children in moral development, especially in traits associated with "self-success"; that in general girls are superior to boys; that there is a close resemblance among brothers and sisters and friends in social and moral behavior, that attending Sunday School and a knowledge of the Bible have little relationship to moral conduct; and that parents, especially the mother, exert much influence upon their children's character, with associates ranking next in importance.

Although there is considerable difference of opinion as to whether moral traits are specific or general, the safest conclusion seems to be that they are neither wholly one nor wholly the other, but arise from a number of specific experiences which the child combines into general principles as his values and goals expand with advancing maturity.

Evidence gathered so far indicates that character traits established in childhood persist into adult life.

Paper-and-pencil tests of the moral attitudes and behavior of high school students show that stealing, drinking, and lying were rated as the worst offenses, while swearing, disobedience, and lying were confessed to most frequently. Little relationship was found between professed moral attitudes and actual behavior.

Few sex differences in moral attitudes were found among college students except in the case of extramarital sex relations, which the women considered to be more serious.

When errors were made purposely in grading examination papers of college students, it was found that the students failed to report errors which raised their scores but almost always reported those which lowered them. When told about the experiment, however, most grading errors were reported whether or not they were to the student's advantage.

Religion does not originate in any instinct, but had its source in man's curiosity about natural phenomena. The idea of original sin is outmoded, most people believing now that children are born with

potentialities either for good or for evil, which society directs. Religious beliefs have changed as man has advanced intellectually, although in many instances they have not kept pace with modern progress.

Under the influence of traditional instruction, children's ideas about God are in concrete terms, which are frequently absurd, embodying the superman idea.

Most early beliefs are no longer held at adolescence, and there is sometimes a sharp drop in religious interests at this period. Supernaturalistic ideas tend to be replaced by more humanistic concepts at the college level.

Prayer at its worst degenerates into a begging ritual, and at its best probably is closely allied to meditation.

In distinguishing living from nonliving objects, the average child goes through four well-defined stages, which hold generally despite differences in sex, geographical location, and socioeconomic status.

Studies on the child's ideas of death are rather limited. At first he thinks of dying as a departure or sleep. Later, he regards it as a further existence in changed circumstances. The personification of death comes next, usually followed by the adult concept of the cessation of bodily life and the continued existence of the soul.

The mystery of what happens to an individual after death is still a problem at adolescence. Some writers feel that the concept of immortality should be abandoned, while others believe that it is a constructive hope for humans to entertain.

The two approaches to religious instruction are (1) the formal or evangelistic, and (2) the "life-experience" approach. Studies show that children become confused over formal theological concepts because these often are beyond their comprehension. This lack of understanding results in a loss of interest in religious services, and in the failure of religious instruction to transfer to everyday life. The "life-experience" method allows children freedom to develop their own ideas about religion. The approach is through challenging activities with emphasis upon everyday behavior. Although it may be objected that this informal method omits systematic religious teaching, it correlates with character development. Some modification of the "life-experience" approach adjusted to the needs of *average* children should be made. Emphasis may be placed upon the wonders of nature, social service activities, parental example and home relation-

ships, and the idea of Jesus as a model for conduct. In this way the child's religious needs come within his experience and comprehension, so that when he reaches maturity he can interpret more abstract religious concepts.

No sudden "religious awakening" occurs at adolescence. In fact, religious interest often is lower during the teens than at any other time.

Mature religion should help an individual to develop a satisfying set of values and should give him a sense of security. It should aid him to expand his feeling of being at home in smaller groups into a sense of belonging in the entire universe.

In addition to character traits and religious attitudes a picture of growth in the first two decades would be incomplete without some attention being given to other interests and activities. In the next chapter, therefore, we shall discuss how reading, radio, and the movies affect development.

SUGGESTED ACTIVITIES

1. Report to the class instances of a small child's inability to generalize from one moral situation to another, e.g., returning over-change from a store or withholding money from the collection in Sunday School, or cheating in school when he would not cheat in a game.
2. Ask your instructor to administer the scales: Attitude Toward God and Attitude Toward the Church by L. L. Thurstone and E. J. Chave, published by the University of Chicago Press, Chicago, 1929-1934. Appoint a chairman to make a class summary.
3. Look up the article on moral attitudes by E. B. Skaggs referred to in this chapter. Check your own attitudes with his results.
4. Read *The Green Pastures* by Marc Connelly, Farrar and Rinehart, New York, 1929, and compare the picture of "de Lawd" presented in the play with children's ideas of God.
5. Look up some of the standard prayers for children and analyze the ideas in them from the standpoint of their effect upon a child's personality.
6. Visit a local Sunday School and classify the procedures as formal or informal in accordance with the discussion in this chapter.
7. If you are a member of a young people's religious group, list three problems which arise most frequently in discussion.
8. Contrast the views on immortality as expressed by M. C. Otto in *The Human Enterprise* (Appleton-Century-Crofts, Inc., New York, 1940),

chap. 11, with those of R. B. Perry in *The Hope for Immortality* (The Vanguard Press, New York, 1945).

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CHAPTER 13

INTERESTS IN READING, RADIO, AND MOVIES

WHY IS READING IMPORTANT?

When our country was first founded, learning to read was considered to be a distinct privilege and was available only to the intellectually elite and to those in favorable social and economic circumstances. Today, however, literacy is looked upon as a necessity to everyday living and is a basic requirement in even the simplest types of occupations. During World War II, for example, it was found that recruits must possess at least fourth-grade reading attainment in order to perform military service satisfactorily. In most modern civilian occupations, also, the individual needs some skill in reading to carry on his job. It is obvious, therefore, that a person in our society must learn to read informational and factual material as well as fiction and recreational literature. Through reading his experiences are broadened and enriched by sharing the ideas and feelings of his contemporaries, as well as those who have lived before him and those in distant lands. He learns to appreciate the past and in this way gains an understanding of modern life and his place in it. Successful citizenship today, also, depends upon a knowledge of community problems and a grasp of international affairs, which are gained primarily through reading.

As a leisure-time activity, reading is of incalculable value. It enables an individual to develop resources within himself so that he will not be dependent wholly upon commercialized recreation and

amusements to occupy his spare time. Guidance in the development of constructive reading interests should begin when the child is young, for "by the age of fifteen the reading interests of both sexes are more or less definitely formed."¹ Since it has been found that children will read almost anything that is available to them, parents, teachers, and librarians have a serious responsibility in providing a variety of worth-while material.

SOME EARLY READING PROBLEMS

Many well-meaning parents, especially from the better economic and social levels, are so impressed with the importance of reading that, unfortunately, they often try to teach the child to read before his nervous system is mature enough to warrant it. These early efforts are more often discouraging than encouraging to the pre-school child. Focusing the eyes upon a printed page is a strain both upon them and upon the nervous system, and often causes damage both physically and emotionally. Furthermore, many parents use the discarded alphabetic method of teaching reading, which does not fit in with child nature. Since it is not the method used by the modern teacher, it can at its best bring only confusion and discouragement.

An example of what may happen to a child who is sent to school before he is ready to read is the case of a seven-year-old boy who was referred to a clinic to determine whether he should remain in the public school system or be sent to an institution for the feeble-minded.

At the time of his examination the child was seven years and one month old, had a mental age of six years and one month, and an I.Q. of 86. His history showed that his mother gave his age incorrectly so that he might enter school at five years. The first-grade teacher tried very hard to teach the child to read, but without success. However, since she was a close friend of the mother's, she recommended him for promotion to the second grade at the end of the year. At first the child showed some interest in reading, but made no progress. Gradually he began to associate failure and dissatisfaction with reading, and when called upon to read would talk to himself and indulge in all sorts of queer mannerisms. The teacher felt

¹ W. S. Gray, "Reading," in G. M. Whipple (ed.), *Child Development and the Curriculum. The Thirty-Eighth Yearbook of the National Society for The Study of Education* (Public School Publishing Company, Bloomington, Ill., 1939), Part I, p. 190.

that this behavior was evidence of low mentality, put him in a corner, and disregarded him. His erratic behavior continued, and it was not until the second year in the second grade that a decision had to be made about his placement

The clinic recommended that the child be removed from school for the remainder of the year and that he be placed in a new school situation where his past record was unknown and where he could have careful guidance in beginning reading.

It is true, in many cases, that the very bright child may learn to read through his own initiative before he is old enough to enter school. It is reported that 44.3 percent of gifted boys and 46.4 percent of bright girls learn to read before starting to school.² With such children, reading should be done under the best lighting conditions, so that eyestrain may be avoided. They should also be encouraged to engage in challenging play activities, so that they will not spend an excessive amount of time on reading but will have a well-balanced program of living. If excessive interest in reading continues into the adolescent years it may interfere with the social activities which are so vital to good adjustment at this stage of development.

Many parents are confronted with the problem of the normal child who doesn't read enough. His dislike may be accounted for by the fact that he realizes he is a poor reader and is not interested in doing things that he cannot do well. Sometimes those with mechanical interests and aptitudes do not care much for reading, but prefer to spend their leisure time making things. Lack of interest in reading may be due, also, to the inability of a child's teachers to find out what particular difficulty or difficulties are responsible for his poor reading. Inaccuracy or inability to recognize words independently frequently accounts for dislike of reading. Occasionally someone in the family does so much reading aloud that the child is unwilling to make the effort to read to himself. If there is no special disability present, probably a challenging stimulus is all that is required. Various means are employed by teachers³ and librarians⁴ to appeal

² L. M. Terman et al., *Genetic Studies of Genius* (Stanford University Press, Stanford, Calif., 2nd ed., 1926), Vol. I, p. 271.

³ G. E. Storm and N. B. Smith, *Reading Activities in the Primary Grades* (Ginn and Company, Boston, 1930), M. E. Pennell and A. M. Cusack, *The Teaching of Reading for Better Living* (Houghton Mifflin Company, Boston, 1935).

⁴ A. Dalgliesh, *First Experiences with Literature* (Charles Scribner's Sons, New York, 1932), chap. 6.

to children of this type, including story hours, homemade movie films, dramatization of stories and pageants, puppet shows, reading clubs, reading charts, certificates, and book exhibits.

The following case illustrates the unfortunate results which may occur if someone reads aloud to a child too much.

Bobby, an 11-year-old boy of superior intelligence, unable to read, was brought to a clinic to ascertain whether or not he was feeble-minded. The father was openly hostile to the child, upbraiding him for his failure to read and his seeming ingratitude for the amount of time which the father had spent reading aloud to him. Bobby's mother had died when he was two years old, and for that reason the father felt it incumbent upon him to devote a great amount of time to the boy. Most of this time was spent in reading aloud, and as a consequence the child developed no desire to read for himself. In school he was promoted from year to year on the basis of his broad background of information. Bobby's teachers felt that he had ability, but they could not understand why he should show so little interest in reading. His father, however, was convinced that failure to read by the sixth grade was ample evidence of feeble-mindedness.

The boy was tutored in phonics, was given simple reading material of a challenging type, and made considerable progress in independent reading in six or seven months. He graduated from high school with a better than average record and was engaged in scientific farming for a time. During the Second World War he served as a lieutenant in the Army Air Corps and was killed in a mission over Germany.

EYE MOVEMENTS IN READING

Reading has been defined as the ability to get thought and enjoyment from the printed page.⁵ To understand this process and to guide its development intelligently, it is necessary to know something about the nature of eye movements.

In reading, the eye moves across the line in a series of jerks and pauses, and it is during the pauses that *real* reading takes place. The eye does not read each letter separately, as is assumed in the alphabetic method of teaching, but rather it reads by cues and shapes. For example, some words, such as *grasshopper*, *candlestick*, or *automobile*, have more variety than words like *when*, *where*, *then*, *there*, *was*, or *were* and are more easily remembered because of their configurations or forms. The meaning is obtained from the shapes of the sentences, phrases, or words, in conjunction with the context. In

⁵ H. B. Reed, *Psychology of Elementary School Subjects* (Ginn and Company, Boston, rev. ed., 1938), p 44.

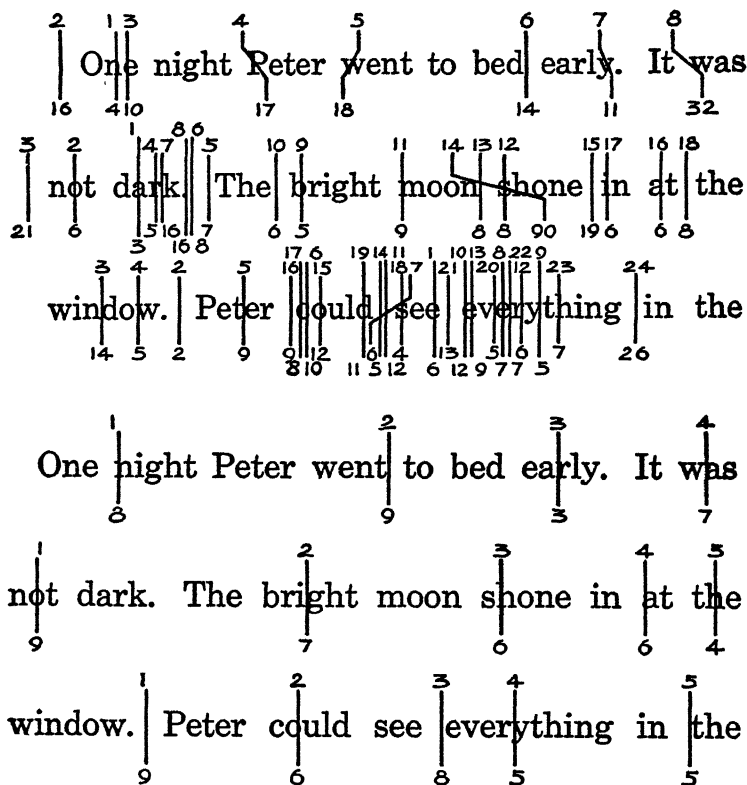


FIG. 65. Eye Movements in Reading The silent reading ability of a second-grade child is shown at the top; that of a college senior at the bottom. The positions of the eye pauses are shown by the numbers above the vertical lines; the numbers below indicate the duration of the pauses in twenty-fifths of a second (Reprinted from *How People Look at Pictures* by G. T. Buswell. Copyright 1935. By permission of The University of Chicago Press, publishers.)

general, more eye movements are made in oral than in silent reading, and children make more than do mature adults. The college student makes about 5.9 pauses per line in silent and around 8.4 pauses in oral reading, whereas a child in grade 1A makes 18.6 pauses in silent and 16.0 in oral reading.⁶ This is shown in Figure 65 which compares the eye movements in silent reading of a second-grade child with those of a college senior.

A poor reader or an immature one tends to read the same word

⁶ *Ibid.*, p. 71.

over and over, and when he does so we say that he makes *regressive* movements. These, of course, are greater in a child than in an adult. The child makes on an average about 5.1 regressive movements in silent reading and 4.4 for oral, whereas an adult makes only 0.5 regressive movements for silent and 1.2 for oral reading.⁷ Children and poor adult readers often whisper to themselves while reading silently. This is referred to as inner speech or vocalization, and retards reading rate. The teacher often finds it necessary to remind the child to read with his eyes instead of his lips. When an adolescent or adult uses inner speech in reading, the situation often can be improved by having him practice reading simple material rapidly without vocalization.

In a comparatively recent study made at the University of Chicago, it was found that at the adult level the average individual should read approximately 175 words per minute orally and 300 words per minute silently. With intensive practice those who read faster than 300 words per minute silently can reach 600 to 800 words per minute in nonfiction.⁸

HOW THE SCHOOL TEACHES READING

In a broad sense it is the purpose of the school's reading program during the first three grades to determine the child's readiness to read from the standpoint of ability and desire. More specific aims are to establish the fundamental mechanics of reading: to reduce the number of eye movements made per line; to eliminate inner speech; to decrease the number of regressive movements; and to encourage accuracy and independence in recognizing phrases and words. Accordingly, methods have been devised which will accomplish these aims.

Small children as a group compose short stories from their experiences, and the teacher prints them either on the blackboard or on charts. In the beginning the child is taught to read these as a unit—usually a short paragraph; then practice is given in reading the different lines in the story, first in sequence and then in random order. He is drilled similarly on phrases and words. The teacher commonly makes use of the following types of devices:

⁷ *Ibid.*

⁸ G. T. Buswell, "Perceptual Research and Methods of Learning," *Scientific Monthly*, 1947, 64:521-526.

Matching sentences, phrases, or words made in duplicate

Matching phrases and words with appropriate pictures

Finding or counting the number of times the same word or phrase occurs in a lesson

Supplying words which complete sentences

Underlining the correct word among other words

Making things by reading simple directions

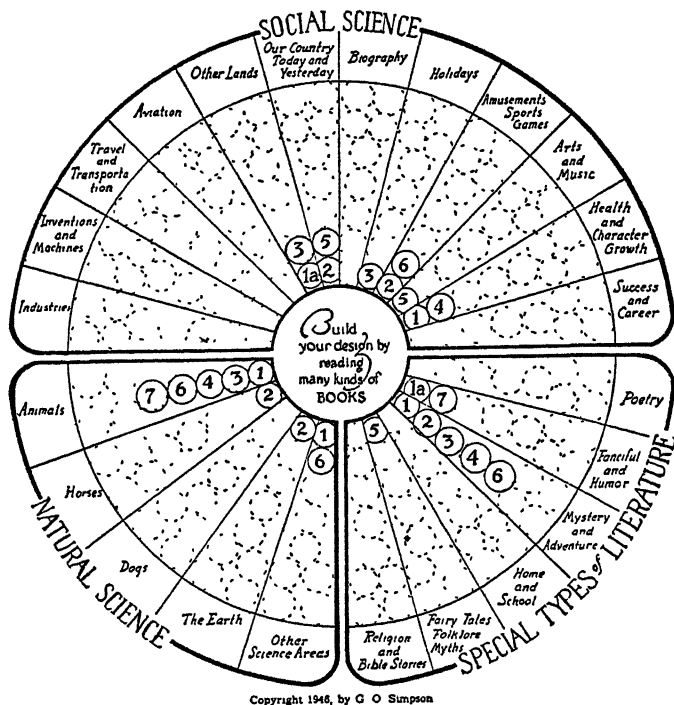
After the child can recognize about 70 to 80 words by sight, some training is given in methods that will enable him to learn certain fundamental sounds as a key to the recognition of unfamiliar or new words. There is still much discussion about the amount of drill to be given or the methods to be used. Traditionally, oral reading is emphasized in the lower grades until it approaches the child's normal rate of speech; then silent reading predominates. It must not be supposed, however, that silent reading cannot be used with beginners.

Between 1935 and 1945 a very successful experiment was conducted by the University of Chicago in which 70,000 pupils in grades 1 to 3 were taught to read by the so-called "non-oral" method.⁹ This method employed a direct association of visual symbols with meanings without either the intervention of oral pronunciation or the consciousness of words as such. Instruction was carried on by means of picture dictionaries, pantomime, and other devices. From their results the experimenters maintain that oral reading should be delayed until the basic habits of the non-oral approach have been established.

Usually real progress is made in reading from the fourth grade on, and it then becomes a tool in learning. As has been said so aptly, "In the beginning grades the child learns to read, but from then on he reads to learn." He must know how to read understandingly in order to comprehend his problems in arithmetic and his assignments in the social sciences and in nature study, if he is to do satisfactory work. When a pupil is poor in reading and receives little or no remedial instruction, he is piling up trouble both for himself and for the teacher. If he is promoted he becomes an educational misfit, and school is anything but a challenging experience.

Between the fourth and sixth grades emphasis is placed upon the extension of the reading vocabulary. Pupils are expected to look up

⁹ Buswell, "Non-Oral Reading; A Study of Its Use in the Chicago Public Schools," *Supplementary Educational Monograph*, 1945, 60: pp. vii plus 56.



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FIG. 66. Reading Designs Showing the Expansion of Interests, Pattern A. (Reproduced by permission of G. O. Simpson, the *News-Journal*, North Manchester, Ind.)

the meanings of words they do not know and are urged to use them in their everyday relationships. Reading for details is emphasized less, and more attention is given to aids which will enable individuals to select the central idea in a paragraph and to express it in their own words. Interpreting what is read is also a vital part of the program in these grades, and the evaluation of ideas is stressed. An example of this is the use of parallel texts in history so that students may see how authors agree or disagree on certain facts. Pupils are asked, also, to discriminate the more important from the less important facts. To help them do this they often are required to outline the main points in a paragraph or article.

During the middle grades an effort is made to give the individual a broad background and variety of reading content which is adjusted to his needs, abilities, and interests. It is a "period of wide

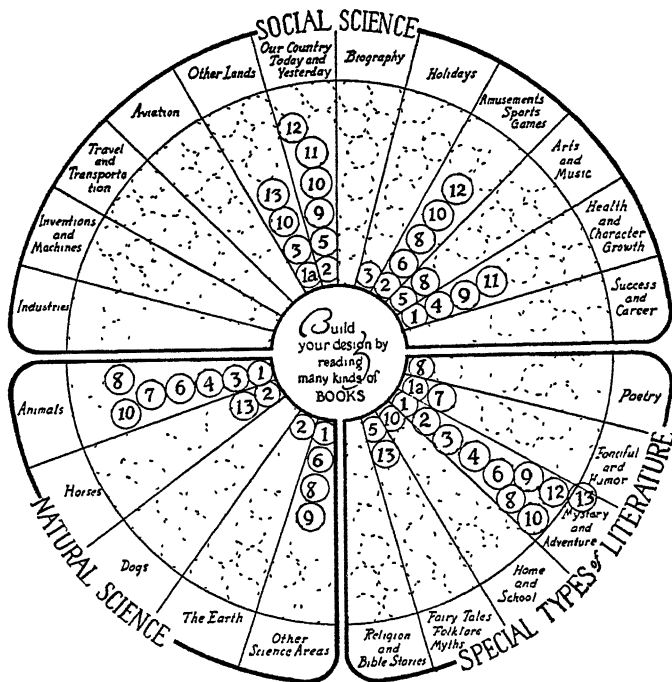


FIG. 67. Reading Designs Showing the Expansion of Interests, Pattern B (Reproduced by permission of G. O. Simpson, the *News-Journal*, North Manchester, Ind.)

reading to extend and enrich experience and to cultivate important reading attitudes, habits and tastes."¹⁰ In order to put these goals into practice, Simpson has devised a graphic record form called "My Reading Design," which stimulates the student to expand his reading interests into many areas, both factual and fictional.¹¹ Different forms are available for grades 1 through 12. Patterns showing the expansion of reading interests are reproduced in Figures 66 and 67. At a glance one can see that in Figure 66 the individual has read seven books in 13 areas, and in Figure 67 he has read six more books in two additional fields. There are, however, eight areas which remain un-

¹⁰ *Report of the National Committee on Reading. The Twenty-Fourth Yearbook of the National Society for the Study of Education* (Public School Publishing Company, Bloomington, Ill., 1925), Part I, chap. 2.

¹¹ Copies may be purchased from G. O. Simpson, the *News-Journal*, North Manchester, Indiana.

explored. These graphs can be had at a nominal cost and are useful in stimulating an expanded and better-balanced program in reading.

Oral reading is not neglected entirely, but the procedure differs from that used in the traditional school. Instead of having each pupil follow his book while one reads orally, audience reading is substituted. In this method one child reads aloud while the others listen with their books closed. When the reading is finished, the entire group participates in a discussion of what has been read.

The aim of promoting constructive reading for leisure time is continued in junior and senior high schools as well as in college. Students are urged to read all types of materials critically and to discriminate between books and magazines which are worth while and those which are not. A wide choice of reading matter is offered now in high school and college classes including modern as well as classical fiction; poetry and drama; folklore; religion and philosophy; the various branches of natural science; self-improvement; history, biography, travel; and current economic and social problems

Extension of vocabulary continues to be an aim at the upper educational levels, and students are encouraged to pronounce new words correctly and to use them precisely. Some experience is provided, also, in the employment of reading as a basic tool in research. This includes learning how to locate information quickly in reference books and in library catalogues, how to read rapidly, and how to grasp and retain general ideas.

Much concern has been expressed in recent years over the poor reading skills of high school and college students, and of the adult population in general.¹² Numerous ways of meeting this problem have been suggested,¹³ and there is a wealth of material on remedial methods and devices. Obviously, education at any level cannot attain maximum success unless those participating in it actually possess the reading ability which the instructional program demands. In the opinion of some experts remedial reading would be unnecessary

¹² For a concise summary, read W. W. Brickman, "Reading Instruction and Improvement," *School and Society*, 1947, 65:231-237.

¹³ P. Witty, "Reading Problems in the Secondary School," *School and Society*, 1947, 65:113-116; also Witty, "Some Uses of Visual Aids in the Army," *Journal of Educational Sociology*, 1944, 18:241-249. G. T. Buswell, *Remedial Reading at the College and Adult Levels: An Experimental Study*, Supplementary Educational Monograph, No. 50 (The University of Chicago Press, Chicago, 1939).

if these skills were well taught and adapted properly to individual needs and interests.

READING INTERESTS OF CHILDREN AND YOUTH

Although there is a great amount of overlapping in reading interests at various age levels, there are some marked general trends. Interest in books usually appears at an early age in children, when enjoyment is derived chiefly from looking at the pictures. "Even as early as eight months some children learn to recognize pictures, and they react to them as to realities"¹⁴ Other children at two, three, or even four years may consider pictures as real objects and will try to pick them out of the page, feed them, etc.¹⁵ This type of behavior is shown in Figures 68 and 69, in which Gua, the ape, and Professor Kellogg's son, Donald, are scratching pictures as if trying to pick them from the page.¹⁶ Around 18 months of age the child may be able to identify objects, and point to them in pictures. At about three and a half years he usually can enumerate spontaneously several objects in a picture.

After the first-grade teacher has succeeded in building up a sight vocabulary in reading, she usually introduces the first book by having the children tell the story from the illustrations.

Pictures are also valuable supplements to books and magazines for older children and even for mature adults, as is evidenced by their increasing use. They help to clarify the content, and make experiences more concrete and real.

Small children¹⁷ should have access to books which contain more picture than content. An interesting sentence, phrase, or even word may suffice. Books of this type, which contain pictures of animals or familiar objects, usually appeal to children of from 18 to 20 months of age or older.

Stories in which the characters perform activities similar to his daily routine enchant the child from two to three years of age because they come within his comprehension. He likes to enumerate

¹⁴ A. E. Tanner, *The Child* (Rand McNally and Co., Chicago, rev. ed., 1915), p. 469

¹⁵ *Ibid.*, p. 470.

¹⁶ Consult W. N. Kellogg and L. A. Kellogg, *The Ape and the Child* (Whitlsey House, McGraw-Hill Book Company, Inc., New York, 1933), p. 92

¹⁷ L. S. Mitchell, *Here and Now Story Book*, Dalglish, *op cit.*, chaps. 1 and 2.



FIG. 68. Gua Looking at Picture Book. (From *The Ape and the Child* by W. N. Kellogg and L. A. Kellogg. Copyright, 1933. Courtesy of the McGraw-Hill Book Company, Inc.)

different things or events in a story. Colored pictures, especially of animals and objects that go—trains, wagons, boats, autos, airplanes, etc.—strike his fancy. He likes rhythm, hence the interest in nursery rhymes and jingles.

Between three and four years of age the child usually becomes less egocentric, and wants to know what people in the pictures are doing and why they are doing it. He likes to have his favorite stories repeated verbatim, and reprimands the storyteller when there are any changes or deviations.

From now on his interests become broader. Imaginative stories and simple fairy tales fascinate him. He professes an interest in poems that dance or have rhythm. He laughs at the grotesque, strange sounds and names used in stories, and at unexpected happenings, especially of a physical nature.

In the primary grades¹⁸ the surprise element appeals to children in

¹⁸ Reed, *op. cit.*, pp. 119–121; Gray, *op. cit.*, pp. 189–190; F. T. Wilson, "Reading Interests of Young Children," *Journal of Genetic Psychology*, 1941, 58:363–389, also "Young Children's Favorite Stories and Characters, and Their Reasons for Liking Them," *Journal of Genetic Psychology*, 1943, 63:157–164.



FIG. 69. Donald Looking at Picture Book (From *The Ape and the Child* by W. N. Kellogg and L. A. Kellogg. Copyright, 1933. Courtesy of the McGraw-Hill Book Company, Inc.)

many situations other than in a story, where it ranks high. The story must move, i.e., it must contain action and much direct conversation. Interesting factual material and wholesome stories and poems embodying everyday experiences fit in at this level of development. The slapstick variety of humor is popular with children in the primary grades, and fanciful stories about animals and fairies appeal. Beginning children are usually satisfied with stories which comprise a mere stringing together of episodes. Toward the end of this period, however, a simple plot may be demanded. In our present school program, where the social studies are so important, there is decided interest in stories about children of other lands: their clothes, homes, food, and methods of travel and transportation.

In the middle grades sex differences begin to appear although not so markedly as at adolescence. Boys become interested in travel, stories of other lands, "adventure, discovery, fighting and mystery," invention and mechanics; girls like stories of home and school life. The boy likes "display of strength, independence, self-control, making a team at the expense of an unfair rival, saving a person's life, and

gaining mastery in physical combat when the opponent is despicable."¹⁹ Qualities which appeal to girls "relate to kindness to others, wearing beautiful clothes, holding a high social position, being honorable and unselfish, being useful in the home, playing pranks at school, gaining the esteem of those worthwhile, being loved and admired for one's self, protecting the weaker, having things happen, being open and not deceitful, and success in dramatics."²⁰

A study of the reading interests of 2000 children²¹ showed that the number of books read increases greatly around the ages of 10 and 11 and that the twelfth or thirteenth year marks the beginning of the "reading craze." Thereafter, some decline occurs in the amount of reading done, probably as a result of the development of other activities during adolescence. By the age of 15 or 16 adult reading interests have become fairly well established, and the sex differences evident in the preadolescent years are accentuated further. Girls are more sophisticated in their reading than are boys. They prefer romantic and sentimental tales such as those published in popular women's magazines, whereas boys like adventure stories and those which feature the winning of success over obstacles. They like books and articles on science and crafts, as well as those on sports and athletics.

Parents frequently are disturbed because boys and girls in their preadolescent and adolescent years, in following their natural reading interests, often seem to spend an inordinate amount of time reading mystery and gangster stories, or sophisticated love tales with subtle inferences about sex. No alarm need be felt over this tendency, and scolding or nagging about it usually serves only to accentuate the desire for this kind of literature. In most instances interest lies primarily in the excitement and adventure involved in the "crime" story. As children mature, and their interests change, they will learn to select and discriminate between "trash" and adventure, if their past guidance has been adequate. In judging the type of materials read by their children, parents also should distinguish between books which are worthless and do not furnish "information, inspiration, or literary appreciation" and those which are harmful morally.

¹⁹ Reed, *op. cit.*, pp 123-124.

²⁰ *Ibid.*, p. 124.

²¹ L. M. Terman and M. Lima, *Children's Reading* (Appleton-Century-Crofts, Inc., New York, 1925, 1926).

A survey of more than 7879 children enrolled in kindergarten through grade 8 chose as their favorite books those which conform closely to adult standards.²²

Intellectual maturity is an important factor in both the type and the amount of material read. Brighter children read considerably more than do children of average intelligence, and their reading interests are well in advance of their chronological age. Children of subnormal intelligence cannot and do not read extensively, and depend upon avocations other than reading.

Home environment is an essential factor in the cultivation of reading tastes. If parents care little for reading, and if no encouragement is given, an abiding interest in it is seldom developed in children and youth.

Although book lists, arranged by age, grade, and intelligence, are suggestive, it is impossible for them to list all the desirable books available—especially among the newer publications. Furthermore, in making selections for some particular child, one must be familiar with his interests, abilities, and environment.

STANDARDS FOR SELECTING CHILDREN'S READING MATERIAL

The following criteria are suggested by trained librarians and research workers:²³

1. Is the book suited to the child's mental level?
2. Will the subject matter appeal to the child, and link up with his everyday life?
3. Is the subject matter worth while; that is, will it bear rereading?
4. Is the book well bound and durable?
5. Is the book suitably illustrated?
6. Is the book well written? (Does it contain good English?)
7. If the book is one of a series, is it merely a repetition of a previous volume, or is it sufficiently different to arouse new interests?
8. Is the book "written down" to children? (This is an undesirable feature.)

In selecting books for older children and adolescents the following standards may be helpful:

²² P. Witty, A. Coomer, and D. McBean, "Children's Choices of Favorite Books: A Study Conducted in the Elementary Schools," *Journal of Educational Psychology*, 1946, 37:266-278

²³ Dalglish, *op. cit.*, chap. 1; Terman and Lima, *op. cit.*, chap. 10.

1. Is the typography of the book good? This includes such things as clearness and size of type face, and quality of paper.
2. Is the book written in acceptable English?
3. Does the book fit in with the individual's maturity and interests?
4. Is the book challenging as well as amusing?

Here again it should be repeated that there are no universal standards for book selection which can be applied indiscriminately. A thorough knowledge of the individual's background, opportunities, and abilities is necessary in order to make an intelligent choice.

WHAT IS THE APPEAL OF THE COMICS?²⁴

When one considers the tremendous appeal of the comics they certainly deserve to be included among the interests of children and youth. According to a *Fortune* poll 65 million people read comic *strips*,²⁵ and it is estimated that between 50 and 60 millions of all ages and from all social levels read comic *books*.

A survey conducted in Hudson, New York, which is typical of the country as a whole, showed that comics lose their appeal as age increases.²⁶ The percentage of individuals at different age levels who admit that they read the comics is as follows:²⁷

| Age Group | Percentage Reading Comics |
|------------|---------------------------|
| 8-15 years | 93% |
| 16-17 | 72 |
| 18-34 | 27 |
| Over 35 | 10 |

In the Army during World War II 44 percent of the men read comics regularly, while another 13 percent read them occasionally.²⁸

Although comics have a long history,²⁹ dating from as far back as 3500 B.C., they have been an important influence in this country only since around 1900. With the introduction of the first comic book in

²⁴ The best appraisal of the comics will be found in the entire December issue of the *Journal of Educational Sociology*, 1944, 18:193-255.

²⁵ J. Bainbridge, "Chester Gould (The Harrowing Adventures of His Cartoon Hero, Dick Tracy, Gave Vicarious Thrills to Millions)," *Life*, August 14, 1944, 17.43, 45, 46, 51, 52, 53.

²⁶ H. Zorbaugh, "The Comics—There They Stand!" *Journal of Educational Sociology*, 1944, 18:196-203.

²⁷ *Ibid.*, reproduced from pp. 197-198.

²⁸ *Ibid.*

²⁹ M. C. Gaines, "The Story of the Comics," reprinted from *Print, A Quarterly Journal of the Graphic Arts*, Summer, 1942, 3. No. 2.

its present form in 1933, *Funnies on Parade*, new problems have confronted the American public—especially parents and teachers. At present much criticism is being voiced against comics, some claiming that they suggest crime and other forms of antisocial behavior.

Today the term “comics” is a misnomer, since their content is not humorous.³⁰ They are, rather, adventure strips whose appeal is primarily emotional. A questionnaire survey³¹ was conducted in Philadelphia of about 500 children from grades 4, 5, and 6 concerning their preferences for comic strips. Humor was mentioned in only 17 percent of the explanations offered in connection with their choices, and four children said that they liked the funnies because they were sad!³²

It seems clear, therefore, that comics are read, not because they are funny, but rather because they present a vivid and realistic picture of almost every phase of contemporary American culture.³³ To the reader the characters seem real, and represent all kinds of people from every walk of life. The stories are packed with thrills and suspense, and the action may take place in any part of the world or at any time in history. The funnies are a part of our modern culture and reflect our ways of thinking and living. That they are an important social force was shown during the Second World War when they served as a propaganda medium for selling bonds, helping the Red Cross, recruiting, etc. They have influenced our ideas on topics like health, safety, and labor, and recently on the content of funny books themselves.

There are all sorts of comic books on the newsstands, and they are written to appeal to all kinds of tastes. They range from those which portray family feuds, show much sexual freedom, and employ colorful and crude language to those based upon incidents occurring in middle-class life, historical episodes, fantastic and bizarre inventions, the classics, and Bible stories.

The individual who feels frustrated or inferior may read the comics because he finds release from his conflicts and tensions at home,

³⁰ W. M. Marston, “Why 100,000,000 Americans Read Comics,” *American Scholar*, Winter, 1943–44, 13. Reprint, 10 pp.

³¹ G. E. Hill and M. E. Trent, “Children’s Interests in Comic Strips,” *Journal of Educational Research*, 1940, 24:30–36.

³² *Ibid.*, p. 35.

³³ S. M. Gruenberg, “The Comics as a Social Force,” *Journal of Educational Sociology*, 1944, 18:204–213.

at school, or among friends. By identifying himself with a hero who always wins he can forget his own problems, at least temporarily, and can feel secure in a make-believe world. If his environment is humdrum or sordid, he may become absorbed in the excitement and adventure pictured in certain funnies. What children of different age levels prefer in stories they like, also, in comics.³⁴ Little children prefer Bugs Bunny, Mickey Mouse, and similar books where animals talk and dress like humans. Later the "Superman" or "Wonder Woman" idea appeals. The child likes to make believe that he can do all sorts of wonders and have all kinds of fantastic experiences.³⁵ He likes fast action and danger, plenty of conversation, and a hero who always wins by the narrowest possible margin. Stories centered about impossible scientific devices thrill him without seeming at all incredible. At this age girls prefer the athletic type of woman who can perform marvelous feats of strength. Later they like situations wherein a "handsome hero" rescues the damsel in distress just in the nick of time.

We have seen that interest in comics declines as children grow older. Nevertheless, it persists into adolescence, as is evidenced by a study³⁶ of 480 boys and girls enrolled in grades 9 through 12

Number of Pupils Interested in Comics

| Grade | Girls | Boys | Both Sexes |
|-------|------------|------------|------------|
| 9 | 67 | 74 | 141 |
| 10 | 58 | 73 | 131 |
| 11 | 49 | 50 | 99 |
| 12 | 67 | 42 | 109 |
| | <u>241</u> | <u>239</u> | <u>480</u> |

It is interesting, also, to note that these high school pupils preferred comic strips to comic magazines. Even in college the influence of comics is seen in the elaborate activities which take place on many campuses in connection with the annual observance of Sadie Hawkins Day.

³⁴ J. Frank, "What's in the Comics?" *Journal of Educational Sociology*, 1944, 18:214-222.

³⁵ L. Bender, "The Psychology of Children's Reading and the Comics," *Journal of Educational Sociology*, 1944, 18:223-231.

³⁶ Witty and Coomer, "Activities and Preferences of a Secondary-School Group," *Journal of Educational Psychology*, 1943, 34:65-76.

Children and adolescents cannot be kept from reading the comics, and even if such restrictions were possible they would be decidedly unfair. If one can look at the funnies dispassionately he must realize that a medium of so wide an appeal must have some merit. This is not to say, of course, that the comics have no shortcomings or do not need improvement.

Articles have appeared in educational journals and elsewhere showing that children classified as nonreaders have made some progress when funny books were introduced as texts.³⁷ These graphic picture stories are attractive to children, and they do not have to be coaxed to read them. Because of the wide diversity of content available in the comics, the child can broaden his fund of general information. He also may cultivate better tastes in reading as a result of the lists of good books and their synopses suggested by such favorite characters as Superman. Although slang and poor English may be used in some comics, the better ones employ acceptable, even if colloquial, vocabulary. According to one survey,³⁸ the typical comic book uses a running vocabulary of 10,000 words appropriate to the average 11- or 12-year-old child. Slang expressions constitute only about 22 percent of the content. Although the make-up of a comic book looks very simple, it represents the tedious and painstaking efforts of highly skilled editorial workers, artists, and technicians.³⁹ As a result, the better comics now are much improved from the standpoint of literature, aesthetic quality, and typography. Most comics try, also, to emphasize desirable character traits and social qualities. The weak are protected, wrongdoers are punished, and in general "good triumphs over evil." Another potential value of the comics is that they provide a vicarious outlet for pent-up aggressions. By projecting himself into the actions of the characters the reader finds relief from frustration, which might otherwise lead to antisocial or even delinquent behavior.

One of the most frequently heard criticisms of the comics is that children and adolescents waste too much time on them. If reading the funnies becomes a mania to the exclusion of other types of activ-

³⁷ W. W. D. Sones, "Comics in the Classroom" Reprint, the *School Executive*, October, 1943.

³⁸ R. L. Thorndike, "Words and the Comics," reprinted from the *Journal of Experimental Education*, December, 1941, pp. 110-113

³⁹ Gaines, "Good Triumphs Over Evil!—More About the Comics," reprinted from *Print, A Quarterly Journal of the Graphic Arts*, 1942, 3: No. 3.

ity, it undoubtedly is harmful to individual and social development. Such a passion for comics, however, is not so much a problem in itself as it is a symptom of maladjustment at home or in school. Although a certain amount of identification with comic-book heroes and heroines is normal, the child who finds it necessary to bury himself completely in the fantasy world of the comics usually is doing so because his *real* environment is uninteresting or intolerable. Forbidding the individual to read comics or burning them is hardly a solution to such problems. Unfortunately, there are still many funny books on the market whose content is socially undesirable and whose make-up is poor typographically and artistically. One of the tasks of parents and teachers should be to help children discriminate between good and poor comics in the same way that they learn to choose good books rather than worthless ones. Some parents have attempted to do this by reading the better comics themselves, discussing them with their children, and making suggestions concerning those which they think are particularly worth while. Thus there is no feud between parents and children over the reading of comics. The youngsters do not have to read them secretly or borrow them from other children because theirs have been destroyed. Some people still feel that the comics contain too many suggestions for criminal and delinquent behavior. There is little evidence that any sizable proportion of delinquency can be traced primarily to the reading of funny books. In an attempt to meet this criticism, however, a number of comic-book publishers have formed a voluntary association to set up regulatory standards and practices regarding their content and distribution.

THE IMPORTANCE OF RADIO LISTENING

The importance of the radio as one of the chief avenues for entertainment and education has increased with its phenomenal growth. In 1920 there were probably fewer than 100 radios in this country; in 1948 there were 75 million sets in 40 million homes.⁴⁰

The radio, being in the home, is obviously more accessible than are the commercial movies. Notwithstanding its accessibility, it is interesting to note that the radio is not so popular with children as are

⁴⁰ From *The World Almanac and Book of Facts for 1949* (New York World-Telegram, New York, 1949), p. 301.

the movies. This is not true of adolescents, however, who spend more time listening to the radio than they do either in reading or in going to the movies.⁴¹

Radio programs designed especially for children have assumed a major role in broadcasting studios in this country only since 1931. It was not until 1933, however, that any objection was raised against them. In that year a protest was made by members of a Parent-Teacher Association group in Scarsdale, New York, who had conducted a questionnaire study⁴² of the effects of radio programs upon the development of children between the ages of 8 and 13. Since then, public opinion has been divided concerning the merits and shortcomings of radio. In the long run, whether radio will become an asset, by "enlarging and enriching experience," or a liability, by "stunting and misdirecting interests," is a responsibility which must be shared mutually by producers and parents.

FACTORS INFLUENCING RADIO INTERESTS

The radio listening habits of children and youth are influenced by a number of factors, as is shown in the Eisenberg study of the radio interests of more than 3000 New York City children.⁴³ His data were secured through questionnaires, personal interviews, and the analysis of scripts. These were checked by means of school themes on radio preferences; telephone conversations with a number of parents; and questionnaires answered by the parents of the children who participated in the investigation. The author also supplemented his material with intelligence test scores and character ratings.

On the whole, children spend more time listening to the radio during the winter months than they do in summer, and they usually prefer the late afternoon and evening hours.

The Scarsdale survey,⁴⁴ to which reference has already been made, shows that radio music appeals to babies even as young as six months, and that its attraction is quite general for the two-year-old. Interest in special programs was evident in children from four to six

⁴¹ A. P. Sterner, *Radio, Motion Picture, and Reading Interests (A Study of High School Pupils)*, pp. 28 and 29.

⁴² Read "The Children's Hour" in the *Nation*, April 5, 1933, 136:363, and "Mothers Fighting Radio Bogies" in the *Literary Digest*, March 8, 1933, 15:32.

⁴³ A. L. Eisenberg, *Children and Radio Programs*.

⁴⁴ "The Children's Hour," *Nation*, April 5, 1933, 136:363.

years old. When children are classified by age, there are two peaks of interest in the radio. The first occurs at six years and the second at 10, with an extension to around 12 or 13.

Although a number of programs appeal to particular age groups, some rank high for all age levels.⁴⁵ These include certain juvenile programs containing elements of adventure and crime, and those broadcast by adult comedians. Around the ages of eight and nine children listen less frequently to programs of "phantasy and make-believe," nursery rhymes, and stories about simple, childish, everyday life experiences. From this time on, news broadcasts and news commentators, humor more subtle than the slapstick variety, and the "drama of the homely" become increasingly popular. Both sexes prefer older characters, but this is particularly true of boys. Although children's programs are popular, from 40 to 50 percent of the juvenile audience tune in on those selected for adults.

When the radio is the chief source of entertainment in the home, the child devotes considerably more time to it than he would if other means of recreation were provided.

The radio interests of children correspond quite closely to their reading interests.⁴⁶ Boys of school age prefer tales of "strenuous adventure," the "conquest over great odds," and certain types of humorous programs. Girls show greater interest in emotional and sentimental stories, especially those concerned with home life. They like fairy tales and adventure stories where women are heroines, and dance music. Although boys and girls may listen to programs designed for either sex, girls tune in on boys' programs more frequently than boys listen to those planned for girls.

Intelligence is also an important factor in the child's choice of a program.⁴⁷ There is evidence that brighter children like variety and prefer narrative programs and programs which make an intellectual appeal, such as those devoted to news and stamp collecting. They select neither serial nor recurring programs. Children of lower intelligence prefer popular dance music, sentimental stories, and serial programs.

According to this study, therefore, it is clear that season of the year, time of day, age, home environment, sex, and intelligence all

⁴⁵ Eisenberg, *op. cit.*, chap. 4.

⁴⁶ *Ibid.*, p. 68.

⁴⁷ *Ibid.*, pp. 69-73.

are important factors which affect the radio listening habits of children in New York City.

A comparison of the radio listening habits of 505 rural and urban children between 9 and 18 years of age was carried on in Washington, D.C., and in Fairfax County, Virginia.⁴⁸ On the average these children and young people spent from one to three hours daily listening to the radio. In Washington, D.C., the children preferred comedy programs and those of the variety type, followed by the romantic, general, and the historical drama.

In another investigation of the radio interests of 701 white and 986 Negro high school students in Chicago,⁴⁹ it was found that the most popular programs dealt with stories, music, variety, and comedy. Only a small percentage enjoyed news broadcasts (the favorites with adults),⁵⁰ and educational programs. Swing music was liked by the boys, but 58 percent of the white girls placed classical music first, such as symphony, opera, and concerts. However, only about one-quarter of the Negro pupils and the white boys preferred classical music. As might be expected, boys were interested primarily in mystery, adventure, gangster, and horror programs, whereas girls preferred romance.

By analyzing radio scripts it has been possible to discover why many children prefer adult to juvenile programs.⁵¹ Writing scripts for children is quite exacting and requires considerable art and skill. The material used must be authentic in every detail. This involves, obviously, an accurate and broad background of information on the part of the writer. Children like action, suspense, and excitement in their programs, but these must be handled skillfully if interest is to be maintained.

Experiments⁵² show that one of the most successful radio plays for children contained experiences occurring in the child's everyday life,

⁴⁸ W. R. Clark, "Radio Listening Habits of Children," *Journal of Social Psychology*, 1940, 12 131-149.

⁴⁹ P. Witty, S. Garfield, and W. Brink, "Interests of High School Students in Motion Pictures and the Radio," *Journal of Educational Psychology*, 1941, 32 176-184.

⁵⁰ See H. Field and P. F. Lazarsfeld, *The People Look at Radio* (University of North Carolina Press, Chapel Hill, 1946).

⁵¹ A. T. Jersild, "Children's Programs. 'Wilderness Road,'" *Education on the Air*, 1936, pp. 129-138.

⁵² J. J. De Boer, "Radio and Children's Emotions," *School and Society*, 1939, 50:369-373.

as, for instance, an incident of a small dog, which had just had its bath, barking at the family cat. It therefore seems unnecessary to introduce "strange, novel, highly stimulating objects, animals, people or incidents" to interest the ordinary child.

In portraying characters much attention must be given to the selection of voices so that they are not too similar. "Talking down" or oversimplifying the story is resented by children just as much in radio as it is in the books they read. Humor is a desirable element for relieving tension and suspense, and it probably will receive more consideration in future radio scripts for children than it does at the present time.

WHAT ARE THE EFFECTS OF RADIO LISTENING?

Opinions of both adults and children on the effects of the radio on its juvenile audience relate primarily to information, attitudes, and emotions.

New York children maintain that listening to the radio aids in enlarging their vocabulary and in acquiring information about "history, geography, music, astronomy, English, health, and current events."⁵³ It may stimulate them to study some subject about which their knowledge is meager, or to tell time so that they will not miss their favorite broadcasts.

In the same study 11 percent of the children attributed the following undesirable behavior to listening to the radio: "acts of disobedience, stealing, setting of bad examples, mischievousness, and fears."⁵⁴

By spending much time in listening to the radio the child may be prevented from participating in some much-needed outdoor play or from studying his lessons. It may interfere with concentration, and thus encourage poor work habits. Listening to crime programs and to offers of cheap gifts as an inducement to buy good or poor merchandise; hearing incorrect speech, and catch phrases of comedians; and imitating the affectations and flippant remarks employed by some of the radio stars are all of doubtful ethical and cultural value.⁵⁵

An investigation⁵⁶ in which photographic records were made of

⁵³ Eisenberg, *op cit.*, p. 144.

⁵⁴ *Ibid.*, p. 145.

⁵⁵ The National Committee on Education by Radio, *Radio as a Cultural Agency*, pp. 5, 6, 29, 34.

⁵⁶ De Boer, *op. cit.*

changes in blood pressure, pulse rate, respiration, and electrodermal responses while children listened to radio plays shows in general that they *do* respond intensely to a wide variety of types of situations, but that "blood and thunder" are unnecessary. For instance, children may react as intensely to a man trying to sing a high note as to an aviator going into a tail spin, or something equally daring.

The radio is also charged with producing bad dreams and nightmares in some of its young listeners. These cases are few, however, and it is conceded that "radio is an incidental rather than a primary cause of fears."

Recordings of 20 different radio programs in which crime was a central theme were analyzed to determine their effect upon preadolescent and adolescent listeners.⁵⁷ It was found that there are too many programs featuring crime in proportion to those dealing with other topics. Instead of relieving frustration through identification, as is claimed for some of these programs, they often actually increase it. From them young people get erroneous impressions of our courts; the characters are fantastic rather than real, and represent symbols rather than people. An intensive study of a typical radio daytime serial, or "soap opera,"⁵⁸ showed that the principal appeal in such programs is identification with characters who represent the listener's desires for personal emotional satisfaction and social status. As in the case of the crime programs, the situations depicted in the serial are unreal and fantastic. Consequently, they tend to lead the listener away from reality, rather than to stimulate genuine ambition and effort.

Children and youth should have careful guidance in the use of the radio if it is to be a source of mutual interest and culture for them and their parents.

Through frank discussion at school and at home they should learn how to select their radio programs with some discrimination. Adults who insist upon calling certain popular children's broadcasts "trashy," and who impose upon youngsters programs suited to adult listeners (as, for example, symphony music, critical news reviews, or abstruse sermons), cannot expect coöperation with such an ap-

⁵⁷ H. Rowland, "Radio Crime Dramas," *Educational Research Bulletin*, 1944, 23:210-217.

⁵⁸ W. L. Warner and W. E. Henry, "The Radio Day Time Serial: A Symbolic Analysis," *Genetic Psychology Monographs*, 1948, 37:3-71.

proach. Parents should endeavor to find out what types of programs interest their children, and the family as a whole might have regular radio hours when they all listen to certain selected broadcasts of music, comedy, drama, etc.

"Zoning" has been suggested by the director of the National Advisory Council on Radio in Education. "For example, from 6 to 8 o'clock in an evening for a given station there would be only dramatic presentations; from 8 to 10 popular music; from 10 to 11 political addresses, and the like. . . ."⁵⁹ Such an arrangement would make it possible to schedule broadcasts that are unsuited to children at a time when they are in bed.

A survey of children's programs in 372 broadcasting studios located in 39 states⁶⁰ indicated that transcriptions are one solution to the problem of scheduling children's programs in different time belts.

To improve broadcasts for children the following standards have been set up. They must:

1. Be entertaining
2. Be dramatic with reasonable suspense
3. Be of high artistic quality and integrity
4. Be expressed in correct English and diction
5. Appeal to the child's sense of humor
6. Be within the child's scope of imagination
7. Stress human relations for cooperative living
8. Stress intercultural understanding and appreciation⁶¹

Complaints to sponsors are effective in removing undesirable programs from the air, and the refusal of broadcasting systems to permit advertisements which are socially offensive⁶² is a commendable tendency toward the improvement of radio.

THE GROWING INFLUENCE OF TELEVISION

It is interesting to speculate as to the possible effects upon children and youth of the comparatively new and rapidly expanding

⁵⁹ The National Committee on Education by Radio. *op cit.*, p 17

⁶⁰ D. Lewis, *Broadcasting to the Youth of America (A Report on Present Day Activities in the Field of Children's Radio Programs)*, The National Association of Broadcasters, 1626 K Street N.W., Washington, D C, 1941

⁶¹ *Ibid*, reproduced from p. 4.

⁶² The Columbia Broadcasting Company forbids advertisements concerning laxatives and deodorants.

field of television. So far, little, if any, research material is available but it seems probable that children will imitate television characters just as they have those of the radio and movies. Articles in current pictorial magazines indicate that the activities of such characters as Hopalong Cassidy are reflected in the play and costumes even of small children. We shall have to wait until more objective data are available before we can reach definite conclusions concerning the influence of television on behavior.

We do have some information, however, which indicates the preferences of children of various ages for different types of television programs. In April, 1949, a survey was conducted by Advertest Research interviewers in the New York Metropolitan area. In all, 513 families containing 740 children between the ages of 5 and 14 were interviewed. In the accompanying table the television preferences of these children are shown by age groups.

TELEVISION PROGRAM PREFERENCES OF 740 CHILDREN
BETWEEN 5 AND 14 YEARS⁶³

| Children Viewing Programs by Age Groups | Howdy Doody (Per- cent) | West- erns (Per- cent) | Kukla, Fran, & Ollie (Percent) | Lucky Pup (Per- cent) | Junior Frolics (Per- cent) | Small Fry (Per- cent) | Milton Berle (Per- cent) |
|---|----------------------------------|---------------------------------|--|--------------------------------|-------------------------------------|--------------------------------|-----------------------------------|
| 5-6 | 80.0 | 57.1 | 42.9 | 42.9 | 31.4 | 42.9 | 20.0 |
| 7-8 | 55.9 | 55.9 | 35.3 | 38.2 | 14.7 | 41.2 | 32.4 |
| 9-10 | 48.0 | 64.3 | 24.0 | 39.9 | 12.2 | 32.3 | 44.1 |
| 11-12 | 36.8 | 52.6 | 10.7 | 15.6 | 10.3 | 16.0 | 57.9 |
| 13-14 | 7.9 | 33.3 | Less than 5 | Less than 5 | Less than 5 | Less than 5 | 62.5 |

It will be seen that many of the programs which appeal to the younger groups decline in popularity as children reach the teens. As one might expect, the program which is most popular with the upper age groups is of little interest to the 5- and 6-year-olds.

Five o'clock seems to be the favorite viewing time for 41.5 percent of all the children in this survey. If we include the interval between

⁶³ Courtesy of "The Television Audience of Today," published by Advertest Research, New Brunswick, N.J., Vol. 1, No. 2, April, 1949.

4:00 and 5:30, then we shall find 74.9 percent of the group at their television sets. For 13- and 14-year-olds 7 o'clock is as popular a viewing time as is 5 o'clock.

Although many parents share these programs with their families, 35.6 percent of the children are restricted in their viewing of television. For example, they are prohibited from using the television sets at supper time, bed time, or when they have homework. Some control is exercised, also, over the length of time spent in viewing and the type of program chosen.

That television is becoming a popular medium of entertainment is attested by the decline in movie attendance of children from homes where there are television sets. This is shown clearly in the accompanying table.

EFFECT OF TELEVISION ON MOVIE ATTENDANCE⁶⁴

| Children Viewing Programs by Age Groups | Previous Movie Attendance (Percentage) | Present Movie Attendance Because of Television (Percentage) |
|--|--|---|
| 5-6 | 30.0 | 20.0 |
| 7-8 | 73.3 | 53.3 |
| 9-10 | 90.9 | 72.7 |
| 11-12 | 94.4 | 77.8 |
| 13-14 | 95.0 | 90.0 |
| All | 63.5 | 50.4 |

The size of the juvenile television audience, also, is an index of its appeal. For example, of the estimated 214,800 sets covered by NBC Television Network 31 percent or 66,588 sets were tuned in to "Howdy Doody" program. Although television is still in its infancy, a great variety of programs designed primarily for children already exists. In addition to those listed above there are film trips to various places in the United States and abroad, dramatization of favorite stories by both puppets and children, and glimpses of circus life. Only the future can tell what the full educational and cultural possibilities of television will be.

⁶⁴ Courtesy of "The Television Audience of Today," published by Advertest Research, New Brunswick, N.J., Vol. 1, No. 2, April, 1949.

WHY THE MOVIES ARE IMPORTANT

When the first motion-picture theater⁶⁵ was opened in Los Angeles in 1902, no one realized how universal this form of entertainment would become and what important problems would develop therefrom. For years adults expressed their opinions upon the virtues and defects of movies, but it was not until 1929 that scientific experiments were made to evaluate the movies as an educational and recreational medium.⁶⁶ Twelve independent investigations were carried on over a period of four years and these have yielded a wealth of information which has proved most helpful in guiding the leisure-time activities of children and adolescents.

The statistics gathered between 1929 and 1933 showed quite conclusively that going to the movies had become a national pastime for 59 million adults and 28 million children and adolescents. Of the latter, 11 million were 13 years old or younger.⁶⁷ Apparently, therefore, it is no longer a question as to whether or not children should go to the movies, but rather one of providing guidance in the selection of appropriate films.

Results showed that movie attendance of boys and girls was greatest over week ends, and it is significant that after the ages of 10 and 11 children preferred night performances. The number of parents attending movies with children decreased as the latter neared adolescence.

WHAT ARE THE EFFECTS OF THE MOVIES?

In view of the fact that so large a proportion of the movie-going public is made up of young people, it is rather surprising that prior to 1930 the producers gave little or no attention to juvenile interests. Another serious shortcoming revealed by the analysis⁶⁸ of 1500 pictures shown between 1920 and 1930 was that they presented a distorted view of life, emphasizing and overvaluing things which are not true in everyday experience. More than three-quarters of these

⁶⁵ E. Dale, *The Content of Motion Pictures* (The Macmillan Company, New York, 1935).

⁶⁶ W. W. Charters, *Motion Pictures and Youth* (The Macmillan Company, New York, 1933).

⁶⁷ H. J. Forman, *Our Movie Made Children* (The Macmillan Company, New York, 1933), chap. 2.

⁶⁸ By Edgar Dale of Ohio State University.

films stressed crime, sex, and love, and marriage and romance were presented as temporary and chance affairs. No dignity was attached to earning one's living, most of the characters seeming to have money without the necessity of working for it. Furthermore, the movie world was one of youth, few characters being portrayed as more than 40 years of age and the majority being in their twenties. Drinking and questionable bedroom scenes were also overemphasized.⁶⁹ Although these undesirable features still appear in some of the present-day "talkies," there are now enough wholesome films from which children and young people can make their selection.

Only the most significant results of the Payne Fund investigations will be presented here, since much of this material has become widely known through the publication of numerous books and pamphlets, and through various educational and religious agencies.

It is a known fact that not even the soundest sleep is without movement, but various factors may account for the degree of motility which is present. A rather ingenious study was conducted⁷⁰ to determine the extent to which movie attendance might affect the motility of children during sleep. In a certain institution a representative group of children was selected for this experiment. A device known as a hypnograph⁷¹ (which means "to measure sleep") was attached beneath each child's bed and recorded every movement made during his sleep. The apparatus was so arranged that the actual recording was done in an adjacent room where constant observation was maintained. A signal light flashed if a child left his bed during the night.

Records were first obtained on the number of movements made by each child under normal sleep conditions. After these controls had been established, the 163 subjects were taken to night movies and data were gathered on the number of movements they made during sleep. More than 6000 nights of sleep, extending over a period of two and a half years, were studied. Results, in general, showed that boys exhibited more restlessness than did girls, although the latter were markedly affected. For instance, a boy who went to the movies and was in bed by nine o'clock showed as much restlessness in his sleep as if he had not retired until midnight; or, to put it another way, the

⁶⁹ Forman, *op. cit.*, chap. 3.

⁷⁰ By Samuel Renshaw and collaborators from the Ohio State University.

⁷¹ A simple description is given in Charters, *op. cit.*, p. 32.

restlessness was equivalent to that produced by drinking two cups of coffee in the evening before going to bed. It was found, also, that some of the children were so emotionally fatigued that their sleep was of a stuporous nature, and thus they were deprived of the recuperative effects that ordinarily accompany sleep.

There is evidence, too, that movies produce undesirable physical effects in addition to disturbances during sleep. Among these are eye fatigue and strain, and the upsets which sometimes accompany the witnessing of horror films, such as fainting, hysteria, and vomiting.

Several investigators studied the effect of movies, both in the laboratory and in the theater, upon the emotional behavior of children and adults. One method involved the observation of variations in the so-called psychogalvanic reflex, or electrodermal response. During emotional experience the moisture on the surface of the skin is increased, and, as a result, its electrical conductivity is also slightly increased. The minute variation can be measured by means of a sensitive instrument called a galvanometer, as explained in Chapter 9. In addition to this means of investigating emotional changes while seeing movies, the experimenters studied variations in pulse rates and obtained verbal reports from their subjects.

According to these results, children's emotional reactions were three times as intense as those of adults, because the former regarded the movie situations as real. However, their reactions were less intense in the second showing of the picture. There was a tendency, also, for them to respond to certain episodes rather than to the film as a whole. Although there were marked individual differences, most children below the age of 12 years were little affected by erotic scenes, many being bored by love and romance. After adolescence, however, the intensity of emotional response to such situations increased greatly.

The verbal reports⁷² also revealed that the younger children often did not understand the actual incidents of the story. For example, a devil's costume was reported as a "monkey" by an eight-year-old girl and by another girl and boy around 15. One nine-year-old boy called it a "fox." It was a "jackass" to a boy of 13 and a "cat" or a "dog" to a 12-year-old girl. A bottle of whiskey was interpreted as a bottle of

⁷² W. S. Dysinger and C. A. Ruckmick, *The Emotional Responses of Children to the Motion Picture Situation* (The Macmillan Company, New York, 1933).

medicine by a girl of nine years of age, and the destruction of a wicked city was believed by some children to be a "cyclone," a "war," a "fire," an "earthquake," a "volcano," or a "cloudburst."

A questionnaire study was conducted to determine the extent to which social attitudes and prejudices were influenced by certain types of movies.⁷³ A group of children answered a number of questions concerning their attitudes toward the Chinese before and after the showing of a film wherein the Chinese were pictured as socially desirable individuals. Marked improvement in their attitudes toward the Chinese was noted as a result of seeing this picture. The same study illustrated how children became prejudiced against Negroes after seeing *The Birth of a Nation*, which emphasized undesirable relationships between Negroes and whites during the Reconstruction period following the Civil War. A checkup eight months later showed that these prejudices still existed, demonstrating that such attitudes become more or less permanent.

Movies also exert considerable influence upon children and adolescents in connection with play and recreation; etiquette; dress and personal grooming; and gestures and language.

Four factors were used in investigating the relation of the movies to the standards of morality held by the general public.⁷⁴ These were: (1) aggressiveness of a girl in love-making, (2) the amount of kissing and caressing exhibited on the screen, (3) the treatment of children by parents, and (4) democratic attitudes and prejudices. These traits comprised a scale of 326 items by which the mores or social standards of different groups, such as college faculty members, social workers, and miners, were measured. It was found that movies lower public standards in regard to the aggressiveness of a girl in love-making, are about parallel to life situations in kissing and caressing, but are above current practice in democratic conduct and in the way children are treated by parents. From this it may be concluded that as potential influences upon social conduct the movies may be good as well as bad. In the advertising used but a few years ago by movie exhibitors, however, the appeal was most frequently made to motives lower than those characteristic of the public at large.

⁷³ Forman, *op. cit.*, chap. 8.

⁷⁴ C. C. Peters, *Motion Pictures and Standards of Morality* (The Macmillan Company, New York, 1933).

The question of how much children remember of what they see on the screen has also been answered by the research referred to already. Evidence is available showing that children retain about 70 percent as much as do adults and that these memories persist,⁷⁵ as is shown in checkups made after a lapse of three or more months. Children 11 to 12 years of age and older remember more than do those between eight and nine. Since all children, regardless of age, accept what they see in the movies as authentic, great care should be taken to prevent the filming of inaccurate information in, for example, historical pictures, newsreels, nature films, or stories dealing with particular epochs in history.

WHAT MOVIES ARE PREFERRED?⁷⁶

The Federation of Mothers Clubs of Cincinnati made a questionnaire study to ascertain what books children would like to see filmed, among those they had previously enjoyed reading. Sixty-three percent of the choices of 100 books which 25 or more children wanted filmed were found on the Winnetka Graded Book List,⁷⁷ which includes the selections of a representative group of elementary school children and librarians. It is interesting to note that not more than five of the books would be classified as "trash" by parents, teachers, or librarians. These suggestions were followed to some extent by movie producers, and films such as *Tom Sawyer*, *Heidi*, *Little Women*, *Snow White and the Seven Dwarfs*, *The Wizard of Oz*, *Pinocchio*, *Bambi*, and *Uncle Remus* were unusual successes.

Another study, made in Toronto,⁷⁸ indicated that comedy is the first choice of children up to 13 years of age; then come mystery movies and musical comedy. The type of comedy which appeals to most juveniles is of the slapstick variety, containing running and chasing, jumping and falling down, climbing, pie throwing, etc.

In the investigation of the white and Negro high school pupils in

⁷⁵ Charters, *op cit*; P. W. Holaday and G. D. Stoddard, *Getting Ideas from the Movies* (The Macmillan Company, New York, 1933).

⁷⁶ Dale, "Books Which Children Like to See Pictured," *Educational Research Bulletin*, The Ohio State University, 1931, 10:423-429.

⁷⁷ The Winnetka Graded Book List comprises the choices of books read by a representative group of 36,750 elementary school pupils, which was submitted to librarians for the purpose of eliminating undesirable selections.

⁷⁸ W. E. Blatz, "What Do Children Think of the Movies?" in W. G. Perlman (ed.), *The Movies on Trial* (The Macmillan Company, New York, 1936), chap. 18.

Chicago, referred to already in connection with the radio, an inventory of movie preferences was secured. On the average these boys and girls attend movies once or twice a week, and their choices are as follows:⁷⁹

| Type of Movie Preferred | Percentage of High School | |
|--------------------------|---------------------------|-------|
| | Boys | Girls |
| Comedy | 81.4 | 81.6 |
| Mystery | 72.5 | 62.0 |
| Western | 57.9 | 32.7 |
| News | 53.4 | 30.3 |
| Cartoon | 53.1 | 40.9 |
| Gangster | 52.2 | 30.3 |
| Educational | 45.0 | 48.6 |
| Love | 24.1 | 70.7 |
| Total number of students | 335 | 366 |

It will be noted that these preferences parallel closely the reading and radio interests of both sexes.

HOW CAN MOVIES BE USED MORE EFFECTIVELY?⁸⁰

As one writer has remarked so aptly: "We can no more eliminate the movies than we can the weather." The best approach to the problem, therefore, seems to be in the development of better regulations governing the production, distribution, and exhibition of movies, and the establishment of more definite standards for evaluating them.

The following suggestions represent some of the ways in which movies may be made to serve the educational, cultural, and recreational needs of children and youth more effectively:

1. Community coöperation should be enlisted to secure a proper balance of films designed for people of all ages and interests.

2. Magazines and newspapers should give accurate information, as some now do, about the content and character of forthcoming films.

⁷⁹ Witty, Garfield, and Brink, *op. cit.*

⁸⁰ F. P. Frutchey and E. Dale, "Evaluating Motion Pictures," *Educational Research Bulletin*, The Ohio State University, 1936, 15 163-165, *Better Motion Pictures for Children, A Study Guide* (American Association of University Women, 1634 Eye Street, N.W., Washington, D.C., 1936), E. Dale, *Children's Attendance at Motion Pictures* (The Macmillan Company, New York, 1935), p. 29.

3. The motion-picture appreciation work now being done in many high schools should be included, also, in the elementary school curriculum.

4. Parents and teachers should try to develop in children and adolescents the ability to evaluate what is seen on the screen.

5. Commercial movies should be considered as but one form of recreation, to be supplemented by home movies, reading, music, and active sports.

6. The physical, mental, and emotional make-up of each individual should be considered as a basis for determining the number and type of movies he should see.

From the material which we have presented in this chapter, it is evident that reading, radio listening, and movie attendance have a definite influence upon development during the first two decades. This is true particularly in regard to emotional and social growth, as is shown by the effect of these media upon the formation of attitudes and standards. A study of the reading, radio, and movie interests of 372 Newark, New Jersey, high school pupils⁸¹ indicates that these "leisure language activities" are not isolated experiences, but rather reflect the general types of interests characteristic of adolescent boys and girls. Thus, whether they read books, magazines, or comics; listen to the radio; or go to the movies, their choices reveal their dominant interests in adventure, humor, and romance. It has been suggested that the common background of experience resulting from these interests should be used more effectively in high school English classes. Furthermore, because of the basic similarity in the interests of adolescents, adults may expect their reading, radio, and movie preferences with few exceptions to follow a common pattern. It would seem wiser, therefore, to try to guide these choices constructively than to single out any particular activity for criticism.

SUMMARY

Reading is a necessity in modern society, both as a tool for learning and as an avocational interest. Although every encouragement should be given to reading, parents should not force their children to read before they are ready.

If parents comprehend the principles governing the nature and number of the eye movements that characterize reading, they can

⁸¹ Sterner, *op. cit.*

understand why the teacher uses certain methods in her reading instruction, and thus can cooperate with her in promoting progress.

It is the purpose of the school's reading program during the first three grades to determine the child's readiness to read from the standpoint of ability and desire.

From the fourth grade on, reading becomes a tool in learning, and every effort is made to give the individual a broad background and variety of reading content adjusted to his needs, abilities, and interests.

In the junior and senior high school as well as in college, constructive reading for leisure time is encouraged, and students are guided in the selection of worth-while reading material. Experts feel that if reading is taught well there should be no need for remedial programs.

Although there is some overlapping in reading interests at different age levels, certain general trends are discernible. Books that contain more picture than content, especially pictures of animals or familiar objects, usually appeal to children around 18 to 20 months of age. Stories about activities similar to his daily routine, colored pictures of objects which "go," and rhythmic jingles fascinate the child from two to three years old. Around the third and fourth years the child is interested in pictures that show the activities of people, and he enjoys verbatim repetition of favorite stories. From this time until the end of the preschool period imaginative tales, rhythmic poems, and strange sounds and unexpected happenings in stories attract him.

Children in the primary grades like the surprise element, much action, and conversation. As their experiences widen, they begin to demand simple plots, also books depicting life of children in distant lands.

In the middle grades sex differences appear. Boys prefer tales of adventure and excitement, whereas books about school and home life appeal to the preadolescent girl. Interest in crime and sex, often shown at this period of development, need not become a source of worry to parents, if previous guidance has been adequate.

By the age of 15 or 16 adult reading interests have become fairly well established and the sex differences apparent in the preadolescent years are accentuated further.

Despite the fact that elaborate book lists and other criteria have

been established for the guidance of reading, the age, sex, intelligence, interests, abilities, and home environment of the individual must be considered when selecting reading material for him.

Comics have a wide appeal to individuals of all ages and from all classes of society. They are not read primarily because they are funny, but because they present a vivid and realistic picture of American culture. They are an important social force, affecting our ways of thinking and living.

Motives for reading the comics vary with the individual's sex, age, and background. Although comics have been criticized sharply, they possess some real merits. There is no chance of eliminating comics, and they are not potentially harmful unless the individual reads them to the exclusion of other activities, or identifies himself with characters found in the poorer ones.

Radio receiving sets are now so numerous that they are accessible to almost everyone in the country, and attempts have been made to evaluate their influence upon children and youth.

Some of the factors which affect the amount of time which an individual devotes to radio listening are: the season of the year, the time of day, age, the home environment, sex, and intelligence.

In general, interests in radio programs parallel interests in reading, although there is considerable overlapping from one age level to another.

Analysis of radio scripts has made it possible to find out why many children prefer adult programs. In preparing scripts considerable skill is required in handling such features as action, suspense, excitement, character portrayal, voice, and humor.

The positive values of radio include: (1) enlarging vocabulary, (2) acquiring factual information, and (3) broadening interests. Its negative aspects include: (1) encouragement of poor work habits and asocial attitudes, (2) use of incorrect and slangy English, (3) cultivation of attitudes of flippancy and affectation, and (4) production of emotional disturbances.

Transcriptions, zoning of programs, complaints to sponsors, and the banning of socially offensive advertising constitute some of the best suggestions made for the improvement of the service which radio can render to children and youth.

We do not know yet what the effects of television will be upon the behavior of children and adolescents. There is evidence, how-

ever, that the television preferences of children change with age and follow in general their interests in reading, radio, and movies. It appears, also, that television is bringing about some decline in movie attendance.

Although the movies are less accessible than is the radio, they are preferred by children and adolescents and have become a universally accepted leisure-time activity.

Careful research upon the content of movies reveals that pictures exhibited between 1920 and 1930 presented distorted views of life and emphasized undesirable social attitudes and behavior.

Movie attendance has been shown to have an adverse effect upon children's sleep, to produce eye fatigue and physical symptoms of emotional disturbance, and to heighten emotional reactions. Movies also exert a pronounced influence upon social attitudes, prejudices, activities, and moral standards.

Children remember much of what they see on the screen, and their interests in movies are similar to those found in reading, comics, and the radio.

Suggestions that have been made for improving the movies should be helpful to teachers and parents responsible for the guidance of children and youth.

Reading, radio, and movies have a definite influence upon development, especially in relation to attitudes and standards. It has been found that adolescents are interested primarily in adventure, humor, and romance, regardless of the medium in which these interests are expressed.

In this chapter we have considered interests which are largely passive and predominantly commercialized. We shall turn now to a discussion of activities which are primarily creative and afford an opportunity for individual interpretation and expression.

SUGGESTED ACTIVITIES

1. From the library or bookstore select six books for preschool children, using the standards suggested in your text.
2. Obtain permission to survey the reading interests of children in one of the middle grades (4, 5, or 6) and compare your findings with data presented in your text.
3. Visit some newsstand or store where comic books are sold and find out which titles are most popular among preadolescents. Examine some of

these and report to the class what you consider to be the reasons for their popularity.

4. Ask each member of the class to submit anonymously a list of the comic strips which he reads regularly. Appoint a committee to summarize these and report the results.
5. Select a current radio program intended for juveniles and have each member of the class listen to one or two episodes. In class discussion, analyze these programs and check them against the standards given in your text.
6. Listen to a radio crime program and discuss in class whether or not it prevents crime, or actually suggests criminal activity.
7. Compare the film version of some well-known children's book with the actual facts of the story, and discuss in class whether the film improved or detracted from the book.
8. Interview people of three different age levels as to their preferences in reading, comics, radio programs, and movies, and note the similarities and differences in their choices for each medium. Observe, also, the changes in these preferences resulting from increased maturity.

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CHAPTER 14

CREATIVE ACTIVITIES

WHAT CREATIVE ACTIVITY MEANS

In the foregoing chapters we have attempted to trace the story of the many-sided process of development during the first two decades. In doing this we have seen the close interrelationships existing between physical, intellectual, emotional, and social growth. Attention has been called repeatedly to the fact that all aspects of growth go on at the same time, although for purposes of clarity it has been necessary to treat them separately.

An interesting and significant phase of development remains to be considered before our picture of growth is complete. This concerns some of the ways in which an individual expresses himself through art, music, and language forms. It is not our purpose to enter into a technical discussion of these three media of creative activity. We are interested rather in considering what they mean to the individual, and how they reflect different stages in his development.

In this chapter we shall consider first the perceptual, intellectual, and emotional aspects of art at different age levels. Next we shall concern ourselves with music as a means of expression, and finally we shall present some examples of how children and adolescents make use of literary forms to convey their thoughts and feelings.

HOW CHILDREN AND YOUTH EXPRESS THEMSELVES IN ART

Obviously, small children cannot use language effectively to convey their thoughts; hence they need many supplementary avenues of

expression, such as art, music, play, and construction work. A very close relationship exists between a child's method of representing visual objects and his intellectual maturity. His emotional adjustment may be reflected, also, in what he draws and paints.

An analysis of children's drawings reveals many interesting facts about the character and development of visual perception. This is shown both in the methods used to portray objects and in the techniques employed to represent space and motion. Methods used in drawing are so universal among children of all races and nationalities as to warrant a perceptual sequence of development up to the tenth year.¹

Two methods used most frequently in studying children's drawings are the biographical and the cross-sectional. The first of these includes more or less systematic observations of a single child's development, made usually by a parent or relative, some extending as far as the eight-year level. The second concerns cross-sectional studies of the drawings made by children of various races and at different age levels, some of them being international in scope.

WHAT DO CHILDREN AND ADOLESCENTS LIKE TO DRAW?

The human figure, as a subject for drawing for children up to 10 years of age, usually ranks first or among the upper three choices. Houses, utensils, plants, animals, toys and furniture, tools, and vehicles are also popular. As one writer points out, "Nothing seems beyond the efforts of the child artist, whether in the heavens above, or the earth beneath, or the waters under the earth."² The subjects of children's drawings change with changing interests. For instance, animals are quite often portrayed by children between 5 and 10 years of age, but from the age of 11 to 17 only about one-tenth of the children make animal representations.

The young "artist" does not use a model when drawing, but represents the object from memory as he knows it.³ Hence, his drawings

¹ F. L. Goodenough, "Children's Drawings," in C. Murchison (ed.), *A Handbook of Child Psychology* (Clark University Press, Worcester, Mass., 1931), chap. 14.

² S. A. McCarty (editor of Child Study Committee of International Kindergarten Union), *Children's Drawings: A Study of Interests and Abilities* (The Williams and Wilkins Company, Baltimore, 1924), chap. 1.

³ W. Stern, *Psychology of Early Childhood: Up to the Sixth Year of Age* (translated from the third edition by Anna Barwell) (Henry Holt and Company, New York, 1924), p. 352.

often show incomplete or inaccurate observations. These defects are quite obvious in the drawing of a man ⁴

At first an oval supported by two vertical lines may satisfy a child's requirements for representing a man. Later he may add some features, although he may omit both the nose and the ears. The features or parts of the body are often misplaced or are out of proportion. By way of illustration: one eye may be set in the forehead, or the arms and legs may be attached to the face! The head frequently is much too large for the body, and the ears, hair, or hands may be out of proportion, because the child enlarges the parts which interest him most.

It has been suggested, also, that this lack of proportion may be indicative of a child's use of caricature.⁵ A critical aunt who was disliked by her small niece was portrayed with big eyes. This was followed up with the remark that Aunt B. could now find the spot on the child's dress!

When the trunk is omitted in children's drawings of a man, the adult explanation is that it is unimportant ⁶ Interest is centered in man because he "speaks, sees, and hears," acts and moves; hence the emphasis on facial features, arms, and legs.

In the drawing of the human figure, as well as in other representations, there is a tendency toward the repetition of an object or ornament. This automatism may be observed in the use of buttons down the front of the trunk, even when trousers or skirts are lacking. As the child matures, however, his drawings become more accurate and detailed perceptually. Necklaces, beads, and other ornaments, hats, feathers, buckles, pipes, and revolvers appear.

The child hits upon a particular stereotyped pattern⁷ for drawing a man, or his features, and the observant adult should be able to identify the child's representation if he is familiar with the type of pattern he employs. This is often referred to as stylization, and comes usually between seven and nine. Examples of patterns used to represent hands are shown in Figure 70.

⁴ J. Sully, *Studies of Childhood* (Appleton-Century-Crofts, Inc., New York, 1896), chaps. 9 and 10; Goodenough, *op. cit.*, and *Measurement of Intelligence by Drawings* (World Book Company, Yonkers, 1926).

⁵ W. Wolff, *The Personality of the Preschool Child. The Child's Search for His Self* (Grune and Stratton, New York, 1946), p. 248.

⁶ *Ibid.*, p. 252.

⁷ H. Eng, *The Psychology of Children's Drawings*; Sully, *op. cit.*, chap. 10.

A rather common tendency among primary children is to draw a part of the body which is hidden,⁸ because they know it is there. A man's leg drawn as visible through his trousers is an illustration. Sometimes a child may be punished unjustly for indicating sex organs with no other than this motive.

Between the sixth and ninth years full-face drawings or those in mixed profile, i.e., the face and trunk facing front and legs to the side, predominate. The figure is in outline form and usually looks rigid and expressionless. Action may be shown as running, kneeling, or kicking, by using angles or lines in different positions, or by drawing a solid or dotted line from the man's eye to an object at which he

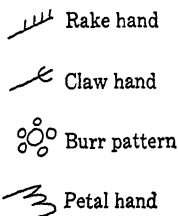


FIG 70. Hand Patterns or Stylizations.

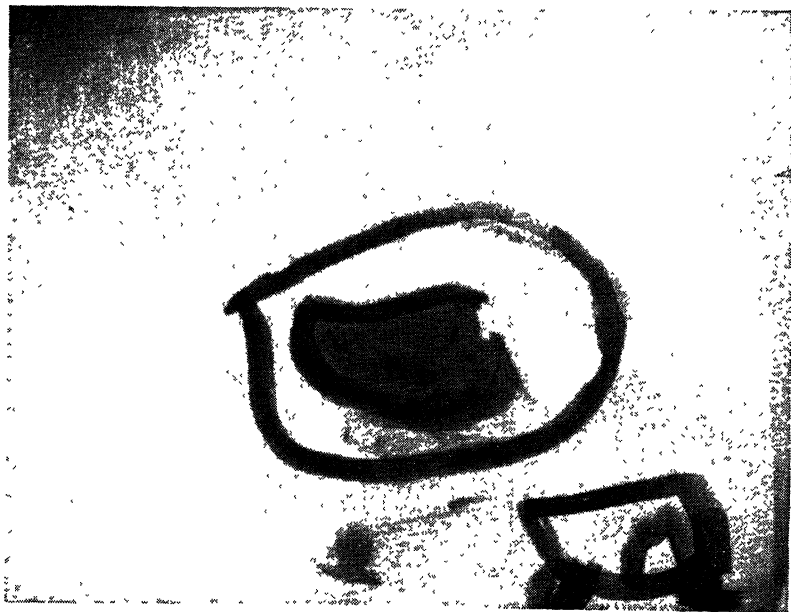


FIG. 71. A "Round House" Made by a Kindergarten Boy.

is supposed to be looking. Objects in motion sometimes are shown by repeating the drawing several times. For instance, an automobile coming down a hill is depicted by drawing several automobiles one after the other.

⁸ Sully, *loc. cit.*



FIG. 72. A Finger Painting Made by a Kindergarten Boy—Showing God, a House, a Tree, and "Moonshine."

It is quite common for the early animal forms to resemble the human being on all fours.⁹ The face usually looks quite human, the trunk is often abnormally thick, and the animal is supported by many legs. Ordinarily the head and trunk are made as one unit without any line of separation.

A child who has not had extensive experience with corners may draw a round house which resembles a crude circle divided into four sectors, or a circle with projections, as illustrated in the painting of a house in Figure 71. Small blind children show this tendency to round off corners in making clay models of houses.

⁹ *Ibid.*

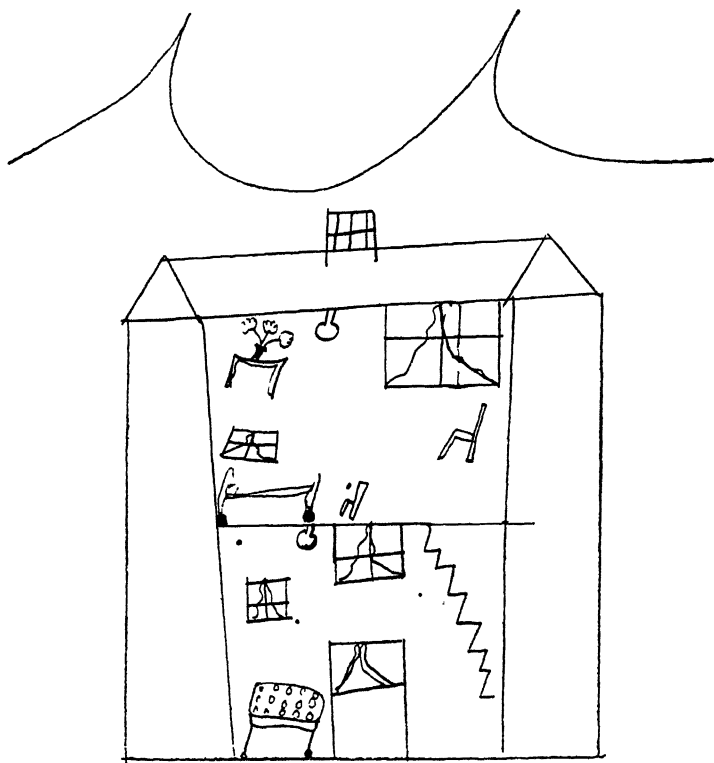


FIG. 73. Drawing of a House Showing Transparency.

Early drawings of houses show other inaccuracies in observation.¹⁰ The tendency toward automatism is characteristic and is shown by the repetition of windows and doors placed in accordance with fancy rather than in any symmetrical arrangement. The people who live in the house or the flowers in the surrounding gardens are often larger than the house itself. Ornamentation and detail are common. Chimneys—with or without smoke—tie-back curtains, large window pulls, plants on window sills, and ornate garden paths may be shown. In portraying exteriors the child again shows “transparency” in his drawings, that is, he shows what is hidden in the interior. The drawing shown in Figure 73 is a clear example of this characteristic. At first no effort may be made on the part of the child to indicate per-

¹⁰ McCarty, *op. cit.*, chaps. 2, 3, and 4.

spective, or, if there is, the technique is rather crude, such as attempting to convey the effect by using a different color to represent the sides of the house. Stylization is used in making houses, flowers, and trees quite as frequently as in producing human figures and features. A few of the more common tree and flower patterns are shown in Figure 74.¹¹

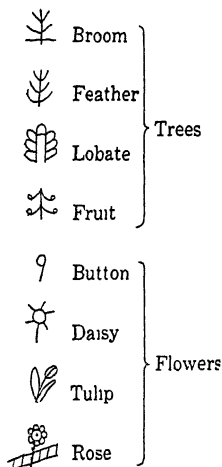


FIG 74 Tree and Flower Patterns

We have sufficient evidence that early drawings of objects, whether animate or inanimate, show the same defects that appear in drawings of the human figure. They are incomplete, out of proportion, transparent, stylized, and ornate, and may show crude attempts at perspective or profile. Most of these errors are self-corrective and will disappear with enriched experience and keener observation.

As the child matures, his concepts about self change, and these are reflected in his drawings of a man. We have seen that the five-year-old emphasizes features, arms, and legs because they represent the activities which interest a youngster at that level. Although a 10-year-old still projects the idea of self in his drawing of a man, his concept is greatly enriched. He now realizes that he is capable of a greater repertoire of actions and movements, and makes use of it in his drawings. By 16 years he relates man to trees and other objects in his environment; shows them in relative proportion; and, in general, portrays an accurate visual representation.¹²

It must not be thought that children draw merely single figures or objects. Around the age of five or six, or even earlier, they may attempt composition or situation drawings where objects are portrayed in relation to one another. A man on horseback (although the relation between the rider and the horse may appear strained!); a hen and her chicks; some Indians, tents, and trees; a boy and girl sitting on a sofa; or a cat chasing a mouse may serve as illustrations.

¹¹ Eng, *op. cit.*, pp 120-121.

¹² V. Lowenfeld, *Creative and Mental Growth* (A Textbook on Art Education).

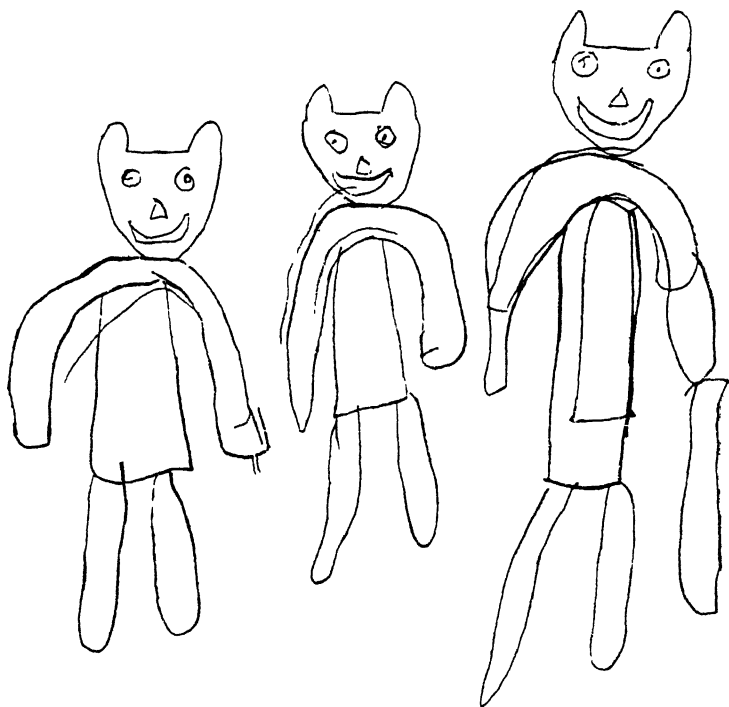


FIG. 75. Drawing of "The Three Bears" Showing Stylization.

ARE THERE SEQUENCES IN DRAWING?

A great deal of controversy has arisen over whether or not there is a perceptual sequence in development as expressed in children's drawings.¹³ An analysis of 602 spontaneous drawings of children from 6 to 12 years of age from 41 countries showed that the products reflected both cultural differences and those due to immediate ex-

¹³ N. C. Meier, "The Graphic and Allied Arts," in G. M. Whipple (ed.), *Child Development and the Curriculum. The Thirty-Eighth Yearbook of the National Society for the Study of Education* (Public School Publishing Company, Bloomington, Ill., 1939), Part I, chap. 8; M. E. Mathias, *The Beginnings of Art in the Public Schools* (Charles Scribner's Sons, New York, 1924); C. W. Waddle, *An Introduction to Child Psychology* (Houghton Mifflin Company, Boston, 1918), chap. 8; Stern, *op. cit.*, chap. 26, K. Buhler, *The Mental Development of the Child* (translated from the fifth German edition by Oscar Oeser) (Harcourt, Brace and Company, New York, 1930), chap. 5.

periences.¹⁴ It was concluded, therefore, that drawings could not be used as an index of development independently of cultural background and experience. Others maintain, however, that "the order of development in drawing is remarkably constant, even among children of very different social antecedents."¹⁵ It is claimed, however, that the "talented child does not conform to the developmental pace of the typical child."¹⁶ The average child goes through a period of development where art is a means of play, a "manipulative stage." This is followed by the "ideoplastic" or "symbolic" stage, in which his drawings are merely symbols for objects rather than real representations of them. The third stage, where an attempt at natural representation is made, is often referred to as the "physioplasic" or "realistic" period.

The Manipulative Stage—Scribbling

Drawing develops from the child's crude scribbles, and it is said that "scribbling is to drawing as babbling is to speech."¹⁷ According to one author, "wavy scribbling is the fundamental form of all drawing,"¹⁸ and circular scribbling is considered to be a higher development than wavy scribbling. A careful observer¹⁹ attempts to classify scribbles according to both form and arrangement. Under the first classification she lists vertical, horizontal, and mixed types, the latter comprising wavy, circular, and variegated scribbles. Variegated scribbles are differentiated further, as zigzag, straight, angles, crosses, ovals, spirals, loops, and rectangles. The second grouping is based upon their position on the paper as "mass," "scattered," or "isolated" scribbles.

In the discussion of prehension (see Chap. 5), the reader's attention was called to the fact that at the end of the first year a child has developed a "superior forefinger grasp" which enables him to hold a pencil. Some children may *imitate* scribbling at 9 or 12 months, and by the time they are 18 months old they can scribble vigorously. At

¹⁴ A. Anastasi and J. P. Foley, Jr., "A Study of Animal Drawings by Indian Children of the North Pacific Coast," *Journal of Social Psychology*, 1938, 9:363-374; D. T. Spoerl, "A Note on the Anastasi-Foley Cultural Interpretation of Children's Drawings," *Journal of Social Psychology*, 1941, 13:187-192.

¹⁵ Goodenough, *A Handbook of Child Psychology*.

¹⁶ Meier, *op. cit.*, p. 175.

¹⁷ Stern, *op. cit.*, p. 350.

¹⁸ Eng, *op. cit.*, p. 104.

¹⁹ *Ibid.*

30 months they may be able to copy a horizontal or vertical line. *Spontaneous* scribbling is slower in developing. It may occur when the child is a year and a half old, continuing beyond school entrance after he has made attempts at drawing objects. These early scribbles are probably made for the sheer joy of motor activity or manipulation rather than as a means of expressing ideas.

According to Biber,²⁰ who made a study of nursery school children between 18 months and four years of age, there are marked differences in the scribbles of the younger as compared with the older ones. Before the age of two scribbling is wholly exploratory, and the eyes do not follow the movements of the hands. The marks also tend to be clustered in a corner of the paper.

Greater control occurs between two and two and a half years, however.²¹ Although the markings are not well organized, a child watches the lines as he makes them, and thus achieves some degree of motor control. In the next six months shape and form emerge, and circular and oval shapes become recognizable.²² After the three-year-old has made a drawing, he is so proud of his accomplishment that he wants his name written on it.

"Symbolic Scribbling"

The child reaches an important stage in development when he names his scribbles either before or after making them. He is now beginning to use his drawing as an expression of ideas. At this phase in his growth a mass of black spirals may represent a litter of kittens, an angular line may indicate a house, and some large circular scribbles may symbolize his mother. To most investigators this "symbolic scribbling" marks the transition from scribbling to real drawing, and may continue until the child is two, three, or even five years of age.

Later, the child's drawings become more realistic and begin to resemble the objects which they are supposed to represent. This level of achievement may be attained between three and a half and four years, and may persist until about 10. It is claimed that circular scribbles merge eventually into the head of a man and the longitudinal scribbles become the extension of the body.²³ The chief char-

²⁰ B. Biber, *Children's Drawings: From Lines to Pictures* (pamphlet) (69 Bank Street Publications, New York, n.d.), pp. 11-15.

²¹ *Ibid.*, pp. 15-19.

²² *Ibid.*, pp. 22-23.

²³ Lowenfeld, *op. cit.*, chap. 3.

acteristics of this "symbolic" or "ideoplastic" stage have already been discussed in great detail in the drawings of a man, animals, houses, trees, and flowers, and need not be amplified here.

The Realistic Stage

When children begin to realize how crudely their ideas are expressed in their drawings and refuse to create because they are dissatisfied with their products, then we know they are approaching the stage of realism. This usually comes between 9 and 11 years, when boys begin to be contemptuous of girls and gangs develop. Both sexes become interested in better methods of presenting objects and are much concerned with color and beauty. This is the point in a child's development where true representative art may be encouraged or inhibited by the attitudes of the parents and the techniques used by the teacher. It is a period when drawing ceases to be a mere form for expressing ideas, but real talent is required to create beauty. Many children turn to craft and construction activities, or substitute play or reading for graphic expression at this stage of their development. This is a good time to emphasize group work in which each child can contribute his share to a project. The modern school is capitalizing upon such interests in its curriculum. Construction work is correlated closely with the more academic phases of the school program and may be employed in such coöperative activities as building a playhouse, a miniature city or farm, making a store, a puppet show, library furniture, or painting a class frieze. Interest in design for decorative purposes may also be encouraged at this stage of development.

The critical attitude toward creative work which develops during preadolescence continues into adolescence and reaches a climax during this period. An experienced art teacher²⁴ insists that creative activity is a natural outlet for expression at adolescence and that no one should be denied it. He suggests that students be classified according to whether they believe in art as a means of visual representation or as a medium through which they can express their emotions.²⁵ Those who use art primarily for expressing emotion would receive quite different guidance from those who are concerned mostly with the visual side of art. In making a picture of a person,

²⁴ Lowenfeld.

²⁵ Lowenfeld, *op. cit.*, chap. 7.

for example, the visually minded adolescent would devote much effort to securing photographic accuracy. On the other hand, the non-visually minded or "haptic" individual would concentrate upon the portrayal of expression and gesture in his subject. Visually minded individuals would receive the traditional type of art training, whereas the "haptic" would be granted much freedom in expressing their personal feelings.

Despite this trend toward realism, those who know adolescents are familiar with the fact that they often amuse themselves by making drawings both in and out of school. To find out the most popular subjects, an analysis was made of a number of junior and senior high school pupils and students in colleges and universities in and around New York City.²⁶ Words printed in a decorative manner, especially slogans and slang expressions, were the favorite form and appeared in 27.3 percent of the drawings. Caricatures, particularly of men, were next in popularity, being found in 22.8 percent of the representations. The human figure ranked next, appearing in 17.2 percent, and conventional designs, sports, animals, and houses were least popular.

Some interesting contrasts appear between the spontaneous drawings of adolescents as shown in this study and those of children. Decorative words and slogans are most popular with adolescents but are rarely found in children's drawings. Although, as we have noted, a few children may use caricature, the New York study showed more than half of the adolescents doing it. Whereas the human form is the most popular subject for children's drawings, it ranks third among adolescents. Furthermore, children most frequently portray full-face drawings, and adolescents tend to draw profiles. Animals, also, are a popular subject with children but are drawn by only 3.6 percent of the adolescents. It seems, therefore, that drawing is to some extent an index of maturity. Apparently the spontaneous drawings of adolescents reflect their interests, and these, obviously, differ from the interests of children.

WHAT IS FINGER PAINTING?

The story of finger painting goes back to February, 1931, when this important means of creative expression was made possible through

²⁶ E. B. Hurlock, "The Spontaneous Drawings of Adolescents," *Journal of Genetic Psychology*, 1943, 63:141-156.



FIG. 76. As a Four-Year-Old Paints. (Reprinted through the courtesy of Binney & Smith Co., 41 East 42nd Street, New York 17, N.Y.)

the ingenuity of Miss Ruth Faison Shaw.²⁷ Her "colored mud," as it is often called, enables a child to use it not only for the sake of manipulation but for creating his ideas freely and boldly as well. Miss Shaw conceived the idea of finger painting when one of her pupils in her school in Italy put iodine on a scratched finger and became absorbed in decorating the bathroom door with it. After much experimentation, the beautiful and harmless "colored mud" was produced, and it is now commercially available.²⁸ A 10-year-old boy is said to have named finger paint when he explained, "We call it finger-paint because you don't have to use brushes."²⁹ Although to artists finger painting may be as old as the race, its rediscovery offers a relatively new field of expression for both children and adults. "The twentieth century was the first time any record was made of its use as an educational device for children, and its present application to recreation,

²⁷ R. F. Shaw, *Finger Painting: A Perfect Medium for Self-Expression* (Little, Brown, & Company, Boston, 1934), p. 3.

²⁸ Binney and Smith Co., 41 East 42nd Street, New York, N.Y.

²⁹ P. J. Napol, "Finger-Painting and Personality Diagnosis," *Genetic Psychology Monographs*, 1946, 34:142

therapy, and diagnosis.”³⁰ Hence, a brief account of its technique and values is necessary.

HOW TO USE FINGER PAINT³¹

A large sheet of paper of sufficient dimensions to allow freedom of movement is pulled through a pan of water. It is laid with the glossy side up on a smooth washable table at a convenient height so the individual may stand while painting. Air bubbles or wrinkles are smoothed out gently before a small spatula of the “colored mud” is smeared over the entire surface of the paper. No definite suggestions after that are necessary, and it is then “every artist for himself.” The painter is not limited to the use of his fingers, as the name would imply, but may employ the side or palm of the hand, fists, elbow, forearm, feet, or any other ingenious device which his fancy may dictate. After the creation is finished it is placed on a large cardboard to dry and is then pressed on the wrong side with a hot iron. Mounting the picture gives it a certain element of completeness.

In finger painting the child develops a technique of his own which is incidental to the expression of his ideas, no matter how bizarre. Note, for instance, the ideas expressed in the finger painting in Figure 72, in which God, a house, an apple tree, and “moonshine” (meaning moonbeams) are all combined in one picture!

Finger painting is a “form of play and relaxation for children as well as an educational experience. . . . This play may be serious, dramatic, realistic or imaginative.”³² It is a valuable supplement to storytelling, and is useful as a means of emotional release or catharsis. The child can express his ideas, fears, and fancies in finger painting and thus free himself from a certain amount of emotional tension. As a therapeutic means it has been quite effective in dealing with cases of “stammering, parental rejection, insecurity, emotional and social retardation, night terrors and avid masturbation.”³³ As has been mentioned previously in connection with personality development (see Chap. 11), too much adult interpretation must not be injected into the situation. A child, for example, may rid himself of a “bogie man” by painting and then erasing him. Miss Shaw did

³⁰ *Ibid.*, p. 148.

³¹ For further instructions consult manual issued by Binney and Smith Company entitled *Shaw Finger Paint*, or R. F. Shaw, *op cit*, pp. 15 and 16.

³² Quoted in Shaw, *op. cit.*, p. 23.

³³ Napoli, *op. cit*, p. 144.

not have such therapeutic value in mind, however, when she developed finger paint. The following cryptic remark on the therapeutic value of finger painting was made by Bernard Shaw: "Are the infants well fed? Their drawings [referring to their finger paintings] betray an obsessive craving for macaroni."³⁴ Despite such witticisms finger painting is helpful in therapy and is valuable, also, to both children and adults as a hobby or means of recreation. As we have seen, it is rated as an important projective technique in the expression of one's personality. It is a medium, too, for decorative, commercial, and fine art.

Lowenfeld³⁵ believes that finger painting is not suitable for children from two to four years of age unless it is employed as a therapeutic measure in cases of maladjustment. In this manipulative or scribbling stage he believes that large black wax crayons or chalk on blackboards constitute the best medium for graphic expression, because they permit "unblurred kinesthetic experiences." He feels, also, that it is better not to use a variety of colors, because they are distracting at this early age. Between 9 and 11 years Lowenfeld thinks that the child is sufficiently mature to "get pleasure out of the motions, texture and color used" in finger painting. He does not recommend it for its own sake, however, but rather as a means for decorative design on useful articles. This practical application of finger painting may be continued into adolescence, but no attempt should be made to imitate nature. Thus it can serve as a stimulating leisure-time activity both for adolescents and adults.

WHEN SHOULD WATER COLORS BE USED?

Psychologists have centered most of their attention upon drawings, and little upon the paintings of children and adolescents. An analysis of 612 easel paintings made by four groups of nursery school children between two and a half and three and a half years of age yields some interesting and useful information.³⁶ The value which children place upon lines as compared to mass is a source of controversy among teachers, some claiming that children prefer lines, others that they like mass better. Results of this study indicate that mass was used in more pictures than were lines, but that both line and

³⁴ Quoted in Shaw, *op. cit.*, pp. 198-199

³⁵ *Op. cit.*, pp. 19, 85, 226.

³⁶ F. F. Ellsworth, "Elements of Form in the Free Paintings of Twenty Nursery School Children," *Journal of General Psychology*, 1939, 20 487-501.

mass were used together most of the time. The author shows, however, that the children, working in groups, imitated each other. Hence, this tendency may have interfered with the techniques which the child might have used if working alone.

Although titles give additional meaning to pictures, only one-fourth of the children formulated them; the others apparently were satisfied with the activity alone.

Most of the children filled the entire space, not confining their efforts to but a section of the paper. There was much repetition of "rows, lines, figures, bands," etc., and the commonest figure appeared in outline form. Mass, however, was used most frequently for background. Practically the same general sequences apply to painting as to drawing. In this experiment random lines were infrequent, and the author says that the manipulative stage is over when form and organization appear in the child's paintings.

Lowenfeld believes that "the techniques used should encourage free expression without intruding technical difficulties." Consequently, he opposes the use of water colors for children in the manipulative stage for the same reason as he does finger painting. In his opinion the child becomes discouraged because water colors tend to run and produce a blurred line.³⁷

Between the ages of seven and nine many children are introduced to water colors by teachers and seem to show much interest in them. Even at this age, however, Lowenfeld³⁸ contends that children are interested in representing neither planes nor depth, but rather are concerned with the repetition of "form, space, and color." Such repetition cannot be accomplished easily by water colors because of their "running quality."

Water colors may be used with children from about 11 to 13 years when they show an interest in portraying nature, especially in securing delicate effects like the sky, atmosphere, clouds, etc.³⁹ Water colors serve as a good medium, also, for stimulating the imagination of older adolescents.

HOW DO COLOR PREFERENCES DEVELOP?

Although the question of when color preferences arise is usually discussed in a general treatment of sensory development, it is pre-

³⁷ Lowenfeld, *op. cit.*, p. 19

³⁸ *Ibid.*, p. 70.

³⁹ *Ibid.*, p. 119

sented here on account of its bearing upon graphic representation. Many studies have been conducted upon the development of color vision, but the results are at considerable variance with each other because of the differences in the techniques used.

In reviewing the literature of the subject Miss Staples⁴⁰ points out that the age of color vision has been set anywhere from the fourth month to the third year. In a rather ingenious and carefully conducted experiment on 262 children under two years of age she tried to discover differences in their responses to red, yellow, green, blue, and gray of equal brightness, and checked these results with 50 preschool children, 100 children from the grades, and 100 adults. Infants respond at birth to the brightness, and not to the color, of colored or uncolored light, but at three months they prefer colors to gray. Color preferences were quite marked between 6 and 15 months, with the following order: red, yellow, blue, green. These colors, which are most liked by babies, are least liked by adults. At 19 months blue is the best-liked color and yellow is the least liked. Yellow is also preferred least by preschool children, grade school children, and adults. Preschool children preferred red, green, and blue; school children blue, red, and green; men blue and women green. Red is best liked until school age, when it is replaced by blue. Girls show slightly more mature color preferences than do boys. In general, then, color preferences may be noticed as early as the third month and change during the preschool period. As the child grows older his choices approach adult standards. These findings are confirmed, also, by an investigation of the developmental aspects of finger painting in first- and sixth-grade children.⁴¹

Another study⁴² shows slight relationship between color vision and artistic ability for elementary school children of the middle grades. Meier,⁴³ however, claims that the ability of children to select harmonious colors increases with age to puberty. It would be interesting to know the extent to which children's color preferences influence

⁴⁰ R. Staples, "Color Vision and Color Preference in Infancy and Childhood (Summary of Investigations from 1890 to 1931)," *Psychological Bulletin*, 1931, 28:297-308

⁴¹ L. H. Blum and A. Dragositz, "Finger Painting: The Developmental Aspects," *Child Development*, 1947, 18:88-105.

⁴² S. Atwell, "Color Vision in Relation to Artistic Ability," *Journal of Psychology*, 1939, 8:53-56.

⁴³ Meier, "Studies in the Psychology of Art," *Psychological Monographs*, 1933, 45.46-62 (experiment by E. J. Williams).

graphic representations. The Chicago study referred to in Chapter 11 offers evidence on this point.⁴⁴ There was some indication that color preferences were influenced by the emotional experiences of the individual.

IS DRAWING AN INDEX OF INTELLIGENCE?

Since drawing seems to follow a developmental sequence and is related to the growth of concepts, it should be indicative, to some extent, of a child's intellectual attainment. Around 1904 an unsuccessful attempt was made to devise an objective age scale with the drawing of a man as a subject.⁴⁵ It was not until 1926, however, that Miss Florence Goodenough published a scale for measuring intelligence based on the ideas found in about 4000 representations of a man made by children of from 4 to 10 years of age.⁴⁶ Fifty-one items are included in the scale, credit being allowed for the presence of certain features or ideas conforming to definitely established standards. The results can be translated into mental ages and I.Q.'s where the child's actual chronological age is known. Specimen drawings are provided to aid the examiner in evaluating test items. This scale, as we have seen in Chapter 7, compares favorably in both validity and reliability with certain standardized verbal and nonverbal tests of intelligence devised for children ranging from the kindergarten through grade 2.

A careful study made upon a small group of four-year-olds at Yale University criticizes the Goodenough scale because it evaluates the "visual appearance" of the man only. The investigator's findings show that knowing the "setting" in which the child does the drawing (the order in which various parts are made, his remarks, purpose, interest, and personality) makes a great deal of difference in evaluating his performance. For instance, a given graphic form may represent several parts instead of one part of the body. A large whole may depict several items, as the head, body, legs, etc. Confusion is also found between naming parts and representing them graphically, e.g., drawing squares for ears but placing them where the eyes normally belong! Therefore, a child is penalized if his drawing is judged by

⁴⁴ R. H. Alschuler and L. B. W. Hattwick, *Painting and Personality* (University of Chicago Press, Chicago, 1947), Vols. I and II.

⁴⁵ Goodenough, *Measurement of Intelligence by Drawings*, pp. 1-2

⁴⁶ *Ibid.*

the graphic product alone, since each part represented is evaluated in terms of mental age.

The Goodenough Draw-A-Man Scale, obviously, is not suitable for older children because their drawings are influenced too greatly by school experience.

HOW IS ART RELATED TO EMOTIONAL ADJUSTMENT?

In Chapter 11 some consideration was given to the use of easel and finger painting as projective techniques in the study of personality. It was indicated that color, line, form, and space are significant in the individual's attempt to express his inner life. The use of color, for example, is related to the nature and degree of emotional conflict which may be experienced either by the child or by the adult.

In the present chapter we have pointed out frequently that the various means of graphic expression may serve as ways for releasing emotional tension. Much insight into a child's motives and social adjustment can be gained, also, through an analysis of his drawings. For example, a fourth-grade boy drew a number of boats in a race and explained that his was first. His best friend's followed him, and the child he disliked most finished *last*.

Educational leaders⁴⁷ feel that art offers a constructive release for emotional conflicts and tensions which accompany adolescence. The heightened sex interest characteristic of this age can find an outlet in the drawing of the human figure.⁴⁸ Artistic activities, such as the decorative work associated with plays, festivals, and dances, as well as art exhibits, provide legitimate opportunities for boys and girls to learn to work together. In addition, art provides a wholesome way of redirecting adolescent fantasies into creative channels. Thus, instead of mere daydreaming, the individual is aided to express his ideas and feelings in a tangible form.⁴⁹

An interesting illustration of the relation of art to emotional experience was seen in an exhibit of children's art held in London during World War II.⁵⁰ The pictures expressed the war experiences of

⁴⁷ A Report of the Committee on the Function of Art in General Education for the Commission on Secondary School Curriculum, *The Visual Arts in General Education* (Appleton-Century-Crofts, Inc., New York, 1940).

⁴⁸ *Ibid.*, pp. 62-64.

⁴⁹ *Ibid.*, chap. 2.

⁵⁰ "Exhibition Extraordinary: Children Visualize War," *Bulletins from Britain*, September 3, 1941, No. 53, p. 5; M. Rose, "Painting as an Aid to Bomb-Shocked Children," *Bulletins from Britain*, April 22, 1942, No. 86, p. 16.

refugee children from Sudeten Germany, Switzerland, France, Spain, Belgium, Czechoslovakia, Russia, Poland, and other countries. Up to eight years most children do not try to express their wartime emotions. From 8 to 12, however, they try to interpret the meaning of war, and give actual scenes of suffering and death.

WHAT IS THE NATURE OF MUSICAL EXPRESSION?

Children use music as a form of expression very early in their development. It is said that the child can sing before he talks, and some attempt at expression through music may be observed in practically all children.⁵¹ There is no agreement as to the extent to which musical ability depends upon inherited factors or how much of it is the product of the environment and special training. Some writers claim that any child, except those with physical defects, can learn to sing,⁵² and others believe that musical performance and even enjoyment are greatly influenced by innate factors.

The work of Seashore has indicated that musical ability is not a general capacity but rather a composite of fundamental musical senses, such as pitch, loudness, consonance, time, timbre, rhythm, and tonal memory.⁵³ Furthermore, these capacities seem to be relatively independent, a high degree of proficiency in one being no guarantee of a like ability in others. For example, an individual may possess great sensitivity in pitch discrimination and be very poor in tonal memory. Thus, according to Seashore, the musically talented person is one who exhibits all or most of these senses to a marked degree. Research on tonal memory, however, has indicated the possibility of a group factor in musical talent rather than the multi-factor theory suggested by Seashore.⁵⁴

Others have suggested that musical talent is an outcome of high all-round ability,⁵⁵ and is especially likely to occur in families of a

⁵¹ Stern, *op. cit.*, chap. 25.

⁵² T. W. Surette, *Songs from Many Lands*, Vol. V of *Childhood. The Beginning Years and Beyond* (Houghton Mifflin Company, Boston, 1937) Statement made by J. C. Foster in the Introduction.

⁵³ C. E. Seashore, *The Psychology of Musical Talent* (Silver Burdett Company, New York, 1919); J. G. Saetveit, D. Lewis, and C. E. Seashore, "Revision of the Seashore Measures of Musical Talent," *University of Iowa Studies*, No. 65.

⁵⁴ E. G. Bugg and L. Herpel, "The Significance of Tonal Memory for Musicianship," *Journal of General Psychology*, 1946, 35:3-15.

⁵⁵ J. L. Mursell and M. Glenn, *The Psychology of School Music Teaching* (Silver Burdett Company, New York, 1931), p. 18.

high cultural level and musical interest. Studies of intellectually superior children with I.Q.'s above 135, as measured by standard intelligence tests, have nevertheless failed to show a consistently high correlation between intelligence and measurable musical talent.⁵⁶ The most reasonable conclusion in the light of available evidence seems to be that the wide individual differences observable in musical talent have their foundation in structural differences which are largely the result of heredity. Without the stimulus and encouragement of a suitable environment, however, such inherited capacities probably will not develop far.

As we have pointed out in earlier chapters, hereditary and environmental factors are integrally related, and their influence upon any given capacity cannot be separated in a practical situation. The authors of the revised Seashore tests say that they are not measuring "strictly the elemental or physiological capacity which is attributed to heredity, but rather the ability to use such capacity when environmental and training factors are reduced to a minimum."⁵⁷

HOW IS MUSICAL TALENT MEASURED?

The first practicable objective measures of musical talent were those devised by Seashore in 1919. The original scale comprises tests for the six fundamental musical capacities which he listed then as: pitch, intensity, consonance, time, rhythm, and tonal memory.⁵⁸

The revised series which appeared in 1939 retains tests for five of the original six capacities. A test for timbre is substituted, however, for that of consonance. Certain changes are made, also, in the method of measuring some of the "musical senses." In the test of time, for example, the subject is now asked to discriminate between the length of musical tones, whereas in the original series he was required to judge the length of *intervals* between clicks. The test for intensity is now referred to as "loudness." The musical tones for all tests are produced electrically to insure purity and accuracy.

Two series, A and B, are available in the revised scale. Each series is recorded upon three double-faced 12-inch phonograph disks and is complete in itself. Both measure the same fundamental capacities, but Series A is designed for use with unselected groups and is more

⁵⁶ L. S. Hollingworth, *Gifted Children* (The Macmillan Company, New York, 1926), p. 204.

⁵⁷ Saetveit, Lewis, and Seashore, *op. cit.*, p. 41.

⁵⁸ Seashore, *op. cit.*

or less of a screening test. Series B is more difficult and is intended for use with selected individuals who have made superior scores on Series A.

In the test for *pitch*, the subject listens to two musical tones and is asked to indicate whether the pitch of the second is higher or lower than that of the first.

In *loudness*, two tones are presented again, but this time the subject must tell whether the second is stronger or weaker than the first.

As indicated already, *time* is measured by having the individual judge the relative length of two musical tones.

The test for *timbre* consists of the presentation of two tones, the second of which is either the same as or different from the first in timbre or quality of overtones. The subject is asked to indicate this similarity or difference.

Two rhythmic series of tones are given in the test of *rhythm*, and the pattern of the second series is sometimes the same as and sometimes different from that of the first. The individual is required to tell whether the second pattern is the same as or different from the first.

In the test of *tonal memory* the subject listens to 30 series of musical tones played twice. At the second playing one of the tones is varied slightly in pitch. After the second playing of each series the subject is required to indicate by number the note which has been varied.

The reliability of the Seashore measures ranges from .62 for some tests to .89 for others.⁵⁹ These tests must be administered under standard conditions and by a competent examiner, however, if satisfactory results are to be obtained. "As measuring instruments they are fully adequate, but the use of them requires tact, skill, ability to motivate, favorable atmosphere, and wisdom in interpretation."⁶⁰

The value of the Seashore tests in predicting success in the study of music has been demonstrated at the Eastman School of Music.⁶¹ On the basis of these tests, used in conjunction with intelligence tests,

⁵⁹ Seashore, Lewis, and Saetveit, *Manual of Instructions and Interpretations for the Seashore Measures of Musical Talents* (Educational Department, R.C.A. Victor Division, Radio Corporation of America, Camden, N.J., copyright 1939, 1942), p. 19.

⁶⁰ *Ibid.*, p. 4

⁶¹ H. M. Stanton, "Measurement of Musical Talent: The Eastman Experiment," *University of Iowa Studies* (University of Iowa Press, Iowa City, Iowa, New Series, No. 291, January 15, 1935).

entering students were classified as: "safe, probable, possible, doubtful, and discouraged." The percentages of those who graduated from each classification were:⁶²

| Classification | % |
|------------------------------|------|
| Safe | 55.1 |
| Probable | 37.5 |
| Possible | 31.7 |
| Doubtful | 19.1 |
| Discouraged | 0 |
| Whole class of 1925 entrants | 33.5 |

It may be seen, therefore, that while the Seashore tests are not infallible in predicting musical achievement, they do provide a rough criterion for estimating the quality of an individual's talent.

Kwalwasser and Dykema also have developed recorded tests of musical talent.⁶³ Their general purpose is to measure approximately the same capacities as those covered by the Seashore tests. The following abilities are measured on five double-faced 10-inch records: tonal memory; quality discrimination; intensity discrimination; feeling for tonal movement; time discrimination; rhythm discrimination, pitch discrimination; melodic taste; pitch imagery; and rhythm imagery.

It will be noted that some of the Kwalwasser-Dykema tests attempt to measure aspects of musical talent different from those covered by the Seashore battery. For example, the test of feeling for tonal movement "measures the ability to judge the tendency of a succession of tones to proceed to a point of rest." The subject is given 30 patterns of four tones, each pattern being incomplete without the addition of a fifth tone. He is required to tell whether the fifth tone needed to complete the series should be higher or lower than the fourth tone. In evaluating melodic taste, two short melodies are played in succession. The opening phrases of these melodies are identical, but the closing phrases are different. The subject must indicate which of the closing phrases makes the better melody.

The reliabilities of the Kwalwasser-Dykema tests are low in most instances. According to Bienstock's study, representative of those which have been made, reliability coefficients on five of the tests

⁶² *Ibid.*, p. 72.

⁶³ C. J. McCauley, *A Professionalized Study of Public School Music* (J. E. Avent, Publisher, Knoxville, Tenn., 1932), pp. 112-114. These tests are distributed by Carl Fischer, Inc., New York.

ranged from 0.09 in time discrimination to 0.52 for tonal memory.⁶⁴ These ratings were based on "test-retest correlations for 69 students retested after a 12-month interval." Bienstock's investigation showed, also, that the Kwalwasser-Dykema tests were of little value in predicting musical achievement among a group of students in the Music and Art High School in New York City.

It has been estimated that, because of the complexity of directions and procedure, the older Seashore tests cannot be used effectively with individuals having a mental age below 9 or 10 years.⁶⁵ This same objection also applies to Kwalwasser's and Dykema's measures, and constitutes a serious drawback to the use of musical tests with young children. In the new Seashore battery, Series A may be given from the fifth and sixth grades onward. Adult norms are provided for Series B, children having the capacity to take this series being rated according to adult standards.⁶⁶

One experimenter claims that the older Seashore tests of pitch, intensity, and consonance might be so simplified and adapted as to be useful with preschool children. Other attempts to measure the musical capacities and development of young children have been made, but as yet no very satisfactory method has been devised. It must be admitted, too, that tests such as those of Seashore measure principally the sensory aspects of music.⁶⁷ The measurement of emotional response to music, which is undoubtedly an important factor, has not thus far been developed for practical purposes. Other tests of musical talent are available,⁶⁸ but those discussed here are representative of this type of measurement.

HOW DOES MUSICAL EXPRESSION DEVELOP?

Musical expression may be divided into two general phases: singing, and rhythmic activity. Music reading and instrumental performance are skills which usually are developed in later childhood and adolescence, and appear to be influenced more by special abilities than the above-mentioned spontaneous activities. It has been sug-

⁶⁴ S. F. Bienstock, "A Predictive Study of Musical Achievement," *Journal of Genetic Psychology*, 1942, 61.135-145.

⁶⁵ Hollingworth, *loc. cit*

⁶⁶ Seashore, Lewis, and Saetveit, *Manual*, p. 16.

⁶⁷ A. T. Jersild, "Music," G. M. Whipple (ed.), *op cit*, p. 136.

⁶⁸ The Drake Tests of Musical Talent and the Oregon Test of Musical Discrimination are fairly well known

gested that children are about 30 months old before they can imitate *inaccurately* simple phrases vocally, and 42 months before they can sing simple four-note melodies.⁶⁹ An interesting experiment in musical guidance demonstrates, however, that babies as young as five months can be taught to "sing." In this experiment,⁷⁰ carried on at Columbia University, Miss Floy D. Rossman succeeded in teaching babies to sing simple, two-note lullabies, based upon familiar sounds and involving an interval of a fifth, as E flat to B flat. These were phrased in words like "*bye bye*," "*ba-by*," and "*la-la*," and were sung "deliberately, slowly, and softly." Later, a third was added, as G, E, C, descending. These were phrased as: "*bye-lo-bye*," "*la-la-la*," and "*ding-ding-dong*." "The children could sing the tone-songs before they could talk," and at 11 months one baby sang a series of seven notes ascending.

Miss Rossman feels that her results are not unusual and that most mothers could do the same with normal babies. She thinks that it is a mistake for mothers, when singing to their babies, to race through an entire melody, rather than to repeat one or two words until the infant can do it. Since their attention span ranges from half a minute to a minute and a half, the singing "lessons" must be brief! Whether or not these accomplishments are typical of *all* babies, they suggest that the musical responsiveness of children can be developed much earlier than is generally believed.

The question as to whether spontaneous songs of little children follow any definite pattern of melody and phrasing is an interesting one, although little conclusive evidence is available upon this point. Stern⁷¹ quotes studies indicating that these spontaneous creations have a minor-third motif with a short range and irregular intervals. The child begins very early to imitate the simple melodies sung to him by adults, although, in some instances, the imitation of the words is superior to the tones.

Williams⁷² suggests a musical achievement chart for normal pre-school children, comprising four different levels: at 18, 30, 42, and 54 months. According to this, at 18 months the child attends to music and shows signs of enjoying it, vocalizes or "dances," and asks for

⁶⁹ H. M. Williams, "Musical Guidance of Young Children," p. 5

⁷⁰ E. D. P. Nelson, "Believe It or Not—Babies Can Sing," *Parents' Magazine*, 1935, 10:16, 17, 100.

⁷¹ Stern, *op. cit.*, p. 345.

⁷² Williams, *loc. cit.*

music by means of various signs or words. At 30 months he can imitate vocally short musical phrases, likes to listen to music, experiments with sounds, and has his own individual singsongs. At the age of 42 months he can sing four-note melodies with adult help, knows the meaning of such words as "fast, slow, loud, and soft," and makes up little songs purposefully. By the time the child is 54 months old he can sing short melodies by himself with fair accuracy, enjoys singing with other children, and likes and invents rhythmic activities. He is beginning to have a repertoire of songs and can make up more complicated singsongs with a distinct musical form. He is more resourceful, also, in doing things with music as an accompaniment. The above sequences may hold roughly for most children, but are affected markedly by individual differences which appear at very early levels.

It is believed, also, by Williams⁷³ that songs for young children should be low pitched, with G above middle C as the pitch center. Attempts to raise the pitch of the voice probably should not be made before the age of six. In addition, large or unusual intervals should be avoided in songs intended for preschool children, and such songs should be short, with simple phrases repeated over and over.

Other studies⁷⁴ show that children's singing can be improved with training. There is disagreement, however, upon the amount of improvement, partly because of differences in method as well as in evaluating performance. Children seem to profit more by a type of instruction wherein they imitate the teacher's voice rather than a musical instrument.⁷⁵ Furthermore, some experiments show considerable permanence in the improvement of singing; it lasted for five months after the training had been discontinued.

Findings indicate, too, that systematic training can greatly increase children's vocal abilities, and that there is a corresponding increase in interest and enjoyment.

It has been suggested that during the early school years singing should be made a natural part of classroom activity, guided by the regular teacher rather than by a specialist.⁷⁶ All types of songs should

⁷³ *Ibid.*, p. 6.

⁷⁴ Jersild and Bienstock, "A Study of the Development of Children's Ability to Sing," *Journal of Educational Psychology*, 1934, 25.481-503

⁷⁵ Jersild, *op. cit.*, pp. 137-138.

⁷⁶ B. Landeck, "Music with the Twos to Nines," in F. Mayforth (ed.), *Children and Music*, p. 11.

be used from popular melodies and folk songs to classics. The aim should be for children to gain maximum enjoyment through spontaneous vocal expression rather than the attainment of any given standard of performance. Furthermore, *all* children should participate in singing, regardless of individual differences in musical ability.

Singing in the middle grades⁷⁷ should be a continuation of what has been done earlier. Here again, the primary emphasis is upon enjoyment, the gaining of musical skills being secondary. Such technical accomplishments as reading music should not be taught arbitrarily at any given age or grade level, but rather should be acquired as the result of a felt need arising from genuine interest in and love of music. The same general principle applies to the formation of choirs, the organization of "song plays," and the development of part singing. These should not be regarded as ends in themselves with emphasis upon adult standards of perfection, elaborate costuming, scenery, etc. Instead, they should serve as a natural means for the enrichment of children's musical expression and enjoyment.

That children enjoy a wide variety of songs is evidenced by Boynton's comprehensive study⁷⁸ of 4473 boys and 4423 girls in grades 1 to 6 inclusive. "These children were distributed from Coast to Coast and from Canada to the Gulf." Each pupil listed or told his teacher the names of three songs which he liked best to sing, and in all 26,688 were given.

It is interesting to note that changes in song preferences occur with increasing maturity. Interest in songs sung in school is predominant in the primary grades but declines after the third grade. There is little interest in classical, semiclassical, dance and jazz, folk and patriotic songs in the lower grades, but there is some tendency for it to increase as children grow older. Boys seem to like mountain ballads more than girls, but the interest in this type of song fluctuates for both sexes throughout the first six grades. Religious songs seem to be liked somewhat better by the younger children, especially "Jesus Loves Me," but this preference does not appear to be influenced greatly by maturity.

Boynton ascribes most of the change in the song preferences of children as they grow older to increasing intelligence. Obviously the

⁷⁷ H. L. Schwin, "Music with the Nines to Twelves," in F. Mayforth (ed.), *Children and Music*, pp. 25-31

⁷⁸ P. L. Boynton, *Psychology of Child Development* (Educational Publishers, Inc., Minneapolis, 1938), pp. 296-303.

songs based on nursery rhymes, which attract small children, are no longer challenging to middle-grade pupils. Broadening experience, too, accounts in part for the rise of interest in patriotic, classical, and popular songs.

A fact revealed in Boynton's study which is significant for the teaching of music in school is that children prefer songs which are slow and restful; consequently, the attempts of teachers to "speed up" singing is contrary to the child's natural tempo.

From the ages of 7 to 17 children and adolescents prefer low-pitched rather than high-pitched songs.⁷⁹ Girls seem to be superior to boys in practically all phases of vocal music.⁸⁰ They have a wider range of intervals and there are very few monotones among them.

As age increases there appears to be a decline in spontaneous singing. This is due probably to increasing self-consciousness as well as to the impersonal atmosphere in which singing frequently is taught. In the high school, musical activities merge with social interests, and membership in choirs, glee clubs, and similar groups often reflects the desire for association with friends more than genuine interest in music. Nevertheless, spontaneous singing is still a popular adolescent activity, as is witnessed by the persistent "vocalizations" of popular songs and by the formation of informal singing groups like barbershop quartets.

As Landeck has said so aptly, "Music can be expressed as completely by rhythmic movement of the body as by singing or playing an instrument."⁸¹

According to Williams' chart,⁸² referred to in connection with singing, the child at 18 months "dances." At 30 months he gets the swing of fast music and makes up simple rhythmic activities. By 54 months he can carry out more intricate rhythms with other children, and also likes to play in a rhythm band.

Although rhythmic response is a natural accompaniment of children's musical expression, their ability to "keep time" with either hands or feet is inferior to that of adults. This ability increases rapidly with age but does not show so marked an improvement with training as does singing.⁸³

⁷⁹ Jersild, *op. cit.*, p. 142.

⁸⁰ *Ibid.*, p. 145

⁸¹ Landeck, *op. cit.*, p. 16.

⁸² Williams, *op. cit.*

⁸³ Jersild, *op. cit.*, p. 139.

Contrary to what might be expected, it appears easier for children to follow rhythm in music played at a rapid tempo (186 beats a minute) than in that played more slowly (76 beats a minute).⁸⁴ They also find it easier to follow rhythm with their feet, as in walking or stepping, than with their hands, as in clapping.⁸⁵ Rhythmic activities play an important role in the life of the preschool and elementary school child. They are sometimes performed spontaneously or are suggested by objects in the immediate environment.⁸⁶ The former is illustrated by skipping, hopping, running, jumping up and down, and clapping for the sheer joy of the activity and its repetition. The latter may be seen in such actions as running a stick along a fence, kicking an object along the sidewalk, rolling hoops, hopping doorsteps, swinging, seesawing, jumping rope, and the like.

It is important for young children to have adequate space in which to engage in rhythmic activities, and, as in singing, the encouragement of spontaneity and enjoyment is the first consideration. To require children to follow some formal rhythmic pattern either in imitation of the teacher or in response to a request "to do what it says in the music" is to reduce rhythm to a mere formal exercise. Instead, the child should be encouraged to use his imagination, which is limited only by his ingenuity. This is shown by the child who "propelled himself across the playground with an irregular bumping movement, saying he was a cake of ice running away from the iceman."⁸⁷ Another small boy who had recently moved from Florida to the Northwest refused to participate in a fairy dance when the teacher played a selection from Mendelssohn's *Midsummer Night's Dream*. Despite every sort of encouragement, he sat motionless in the middle of the room. Finally, in response to the teacher's questioning, the child explained that he couldn't dance like a fairy because he was a frozen milk bottle! In his Florida home he had never seen frozen milk and he was fascinated with this new experience.⁸⁸

In the middle and upper grades simple folk dances, clog and tap dancing, relays and various forms of dodge ball are used extensively

⁸⁴ *Ibid.*, p. 140.

⁸⁵ *Ibid.*

⁸⁶ A. G. Thorn, *Music for Young Children* (Charles Scribner's Sons, New York, 1929), chap. 3.

⁸⁷ Cited by E. D. Sheehy, "From Movement to Dance or the Progressive Growth of an Art," *Childhood Education*, 1947, 23.230-235.

⁸⁸ *Ibid.*

as rhythmic motor activities. Care should be taken, however, to follow the children's interests rather than a formal course of study.

On the secondary level intricate folk dances are popular, such as the Virginia Reel, the Norwegian Mountain March, and "Sweet Kate." More highly organized games appeal, also, like volleyball, paddle tennis, deck tennis, badminton, and others. With the expansion of sex-social interests after adolescence, young people like ball-room dancing, and this constitutes the preferred form of rhythmic activity during youth and early adulthood.

WHAT IS THE PLACE OF INSTRUMENTAL MUSIC?

With the present trend toward music as a means of expression rather than as an "accomplishment,"⁸⁹ we should expect to find somewhat less emphasis upon the teaching of sight reading, instrumental performance, and similar technical skills. There is a wide diversity of opinion as to when and how instrumental music should be taught and what instruments are best adapted to the child's abilities and interests.

It has been suggested that simple percussion instruments are most suitable for the small child, because this method of producing musical sounds arises naturally out of his experiences.⁹⁰ Mere "noise makers" should not be employed, but simple instruments, such as the triangle, cymbals, and doweling sticks should be selected, which produce good tones of a distinctly different quality. These instruments should be introduced one at a time, and children's attention should be called to the differences in their "singing tone." Experience should be provided, also, in choosing the proper instrument to portray a given selection appropriately, like using doweling sticks instead of a drum in rendering "Hickory, Dickory, Dock." Eventually, children will be able to listen to and identify the "voices" of the various instruments when played together.

The piano is said to be the typical child's instrument, since it requires less fine neuromuscular coordination than do reed and string instruments, and it also has the advantage of fixed pitch divisions. It has not yet been determined conclusively whether group or individual methods of piano instruction are most satisfactory, nor do we

⁸⁹ R. Minor, *Early Childhood Education* (Appleton-Century-Crofts, Inc., New York, 1937), chap. 18.

⁹⁰ Landeck, *op cit.*, pp. 19-21.

know the extent to which various "gadgets," such as keyboard charts and the like, are helpful.

One experimenter,⁹¹ after giving extended instruction to a group of preschool children in playing a tin fife, concludes that the effort required is not justified by the results obtained.

Some authorities believe that the best approach to instrumental music, and also to the development of musical appreciation, is through encouraging the older child to make tuned drinking glasses and such instruments as flutes, xylophones, drums, etc.⁹² In this way it is believed that he will develop an understanding of the fundamentals of tone production and will be stimulated to acquire the necessary skills for musical performance in an interesting manner.

It should be reiterated that music offers a valuable means of creative expression, enjoyment, emotional satisfaction, and release of tension in children, and these should be the principal considerations in guiding their musical development. A careful study of individual differences in musical talent and interest should determine the extent and comprehensiveness of the child's musical education. All children, however, should be encouraged to sing and engage in simple rhythmic activities with freedom and spontaneity. Such activities, too, provide a valuable means of socialization and group coöperation.

We have noted already that adolescence brings an increased desire for status with peer groups. One way in which status may be gained is for the individual boy or girl to possess some ability or skill considered desirable by his or her associates. Musical accomplishment, especially the ability to play the piano, may serve this purpose and often may provide an entree into a social group which otherwise would be closed to the individual. There is some indication, also, that the emotional adjustment of older children and adolescents who have had experience with music is better than that of those who have not.⁹³ It is not clear, however, whether the musical experience is a cause or an outcome of good adjustment.

⁹¹ M. G. Colby, "Instrumental Reproduction of Melody by Preschool Children," *Journal of Genetic Psychology*, 1935, 47, 413-430.

⁹² S. N. Coleman, *Creative Music for Children; The Master Library*, Book III; also E. Waterman, *The Rhythm Book; A Manual for Teachers of Children* (A. S. Barnes and Company, Inc., New York, 1936), chap. 5.

⁹³ W. S. Graves, "Factors Associated with Children's Taking Music Lessons, Including Some Parent-Child Relationships: I, History and Procedures," *Journal of Genetic Psychology*, 1947, 70:65-89, II, "Results and Conclusions," 91-125.

HOW CREATIVE WRITING DEVELOPS

In Chapter 6 we saw how the infant develops speech and how the young child engages in various language activities spontaneously, and experiments with sounds and rhymes for the sheer joy of it. As he grows older he becomes interested in telling others about his experiences, both real and imaginary. In the primary grades a child still manifests considerable spontaneity and originality of expression. With the introduction of stereotyped language exercises, however, and with increasing emphasis upon conformity to a conventional pattern, much of the freedom and "sparkle" of expression is lost. This conventionality appears to reach its height at adolescence, probably not only as a result of the school language program but also because individuals at this age level have a strong desire to follow the pattern set by their peers.

We have already traced the normal development of spoken and written language and shall not repeat this material here. Rather, we shall turn our attention now to the often neglected mode of expression referred to as "creative writing." By creative writing we mean the unique way in which one expresses his thoughts and feelings, and conveys them to the reader with vividness and charm. It seems doubtful if the majority of individuals can achieve genuine literary creativity of a high order. Many, however, could write more interestingly if they were encouraged to be spontaneous rather than to imitate commonplace forms of traditional style.

Small children have a delightful way of expressing themselves, which often is quite different from that of older persons. Their descriptions and comparisons are more direct, more closely related to their experiences, and richer in imagery.⁹⁴ An adult may speak of something being "as slow as cold molasses," but to the imaginative five-year-old slowness is: "slow as you grow up"; "slow as your new teeth come in"; or "slow as one man building a bridge." Again, instead of the hackneyed phrase, "quiet as a mouse," the five-year-old may say: "quiet as you close your eyes"; "quiet as a thermometer goes up"; "quiet as sunshine comes out"; or "quiet as you cut cotton."⁹⁵

⁹⁴ L. S. Mitchell, "Language," in *An Approach to the Arts for Teachers and Other Lay Adults*, pp 1-3

⁹⁵ C. Lewis, "Deep as a Giant"—*An Experiment in Children's Languages*.

Children grasp very early the rhythm and sound of words—the basis of all poetry. An interesting example of this is shown in the following poem dictated by a two-year-old:⁹⁶

Remember the goldfish?
Remember?
Remember the goldfish?
Goes round and round!
Umm!
Swims!
Umm!
Sleeps!
Umm!

Remember the goldfish?
Has no hands.
No.
Has no feet.
No.
Remember the goldfish?
Has no hands!
Remember the goldfish?
Has no hands.

This feeling for sound continues in young children throughout the primary and lower grades, and, if encouraged, may result in poems which are rich both in meaning and rhythm. The following are examples:

MY BIRTHDAY⁹⁷

Today is my birthday
And I received lots of toys.
I had a birthday party
And invited many girls and boys.

I got a book and an airplane
With great big wings.
I got a drum, some soldiers,
And many other things.

⁹⁶ Reproduced by courtesy of Lucy Sprague Mitchell from "Ages and Stages," *Child Study*, February, 1938 (69 Bank Street Publications, New York). This poem was quoted from an original Bank Street School record.

⁹⁷ Reproduced by courtesy of the author.

Today I am eight years old
 And next year I'll be nine.
 I hope you'll all enjoy your birthday
 As I have enjoyed mine.

*James Shields
 Grade 2, Ruskin School
 Dayton, Ohio*

A P O E M⁹⁸

When the wind goes,
 "Oo-Oo-Oo-"
 When the sky is
 Blue, blue, blue,
 When the sun is out, out
 We all play about.
 I like to play on a sunny day.
 I do and so do you.

*Angelina Correia, age. 9 years
 Perkins Institution
 Watertown, Massachusetts*

THE CHICKADEE⁹⁹

All the birds are gone away
 In their southern homes to stay
 But yet you may hear
 The voice of some little dear
 Singing, "Chick-a-dee, chick-a-dee, chick-a-dee."
 Up in the apple tree
 When we are in our winter coats
 You may hear his bright cheery notes singing
 "Chick-a-dee, chick-a-dee, chick-a-dee."

*Fannie Correia, age: 10 years
 Perkins Institution
 Watertown, Massachusetts*

THE LI'L' OL' LADY WHO LIVES ON DA FARM¹⁰⁰

The li'l ol' lady who lives on da farm,
 In a li'l ol' house so cozy an' warm,

⁹⁸ From "Suggestions for Motivating Primary Braille Reading," by F. K. Merry, by courtesy of the publisher, The American Foundation for the Blind, Inc., New York, 1929, p. 16.

⁹⁹ *Ibid.*, p. 18.

¹⁰⁰ From *Shafor-Views*, February, 1937, 18. (By courtesy of Edwin D. Smith School, 1701 Shafor Boulevard, City of Oakwood, Dayton, Ohio.)

Rockin' away
From night 'till day,
Knittin' an' singin,' away from harm.

The sun stopped shinin';
It began to rain.
With a splash and a splatter,
It fell on da pane.

All at once she heard a 'larm,
It scared the po'r li'l lady who lives on da farm.

*Patsy Marshall
Sixth Grade, Edwin D. Smith School
Oakwood, Dayton, Ohio*

Anyone familiar with children can attest to their unlimited imagination. In fact, adults frequently are worried over the child's apparent inability to distinguish between reality and fantasy. This richness of imagination, however, is one of the most charming qualities in the stories which children invent or retell. The following fable, retold by an eight-year-old blind girl, is an illustration.

HOW THE SUN CAME¹⁰¹

Once upon a time there lived a little girl. She was only four years old. Her name was Wee Lucy O'Connor. She lived with her father and mother in a pretty little cottage.

One day Wee Lucy asked her mother if she would tell her a story of how the sun came. Her mother said, "Yes." So Wee Lucy O'Connor started out to the front steps and sat down with her mother.

"Well," said her mother, "the sun is a big ball of fire. It does not go to bed at night. It stands still in the sky. It does not move. Only, when the world turns around, it shines on the other side of the world. Then it makes it night on this side of the world."

"But," said Lucy, "I thought that the sun went to bed at night."

"Well, it does not," said her mother, "but you must listen." So mother began:

"One day, many, many years ago there was a fox. He lived in the woods. It was always night in those days. One day the fox was on the beach and he saw a tiny thread of light coming from behind a fleecy cloud in the sky."

"Was that the sun coming?" asked Wee Lucy.

"Yes," said her mother, "but you must listen now."

"Well," said her mother, "the light grew bigger and bigger, and soon

¹⁰¹ F. K. Merry, *op cit*, pp. 14-15. Reproduced by courtesy of the American Foundation for the Blind, Inc.

warm sunshine was shining on the beach. The fox saw the shadow on the beach and was afraid. He thought that it was another fox, and he was afraid because he thought the other fox might fight when he turned his back. So he jumped into the pond and was drowned."

"Please tell me some more about the sun," begged Wee Lucy. So her mother began:

"Well, each warm day the sun shone brightly upon the beach. The people who first saw it began to think it very queer, indeed, for it had always been night at that time. But after a while a little fly told them that it was the warm, pleasant sunshine.

"One day a bear told the other animals that the warm sunshine had come, and each day the animals would climb the fences and watch the bright sun shining so brightly in the sky."

Pretty soon her mother said, "Now, Lucy, it's time for you to go in and play with your dolls."

Wee Lucy always remembered the story which her mother told her.

*Ruth Enid Price, age: 8 years
Perkins Institution
Watertown, Massachusetts*

The triteness and conventionality often seen in the writing of adolescents is well illustrated in the following story by a ninth-grade girl.¹⁰²

Sir John Binghampton sat in his library, pouring over his books. He became so absorbed in his work that he fairly devoured the pages. Suddenly he arose and stamped his feet. Then he whipped his papers into shape and called, "Hannah, come here." Hannah came tripping into the room.

"Where is Lady Anne?" he shouted.

"She is in the garden, sir," replied Hannah.

"Bring her to me," Sir John thundered.

Hannah flew to do his bidding.

Sir John crossed the floor slowly once, twice, then thrice. Pausing he ground his teeth into a rage, and tore his hair. Just then Lady Anne came sweeping into the room.

"Lady Anne, I beg of you again, will you marry me?" cried Sir John.

"Oh, no, no, sir," said Lady Anne.

"Then I will put you into a dungeon till you do," snarled Sir John.

"Oh, Sir, I *appeal* to you," begged Lady Anne. "Do not be so heartless."

"Your appeal is fruitless," he replied, and left the room.

Lady Anne fluttered about the room in an agony of fear. Eagerly she

¹⁰² Reproduced through the courtesy of the teacher of a ninth-grade girl. (Spelling and punctuation are uncorrected.)

scanned the horizon as the sun rose and set. Suddenly a whistle sounded beneath the window. Eagerly she pulled up the shade.

"Oh, Harold my true love, is that really you," she called.

"Yes, Anne, my dear. Throw me a line," shouted Harold.

Harold came galloping into the room and threw off his disguise.

Lady Anne cast down her eyes upon the floor.

Lovingly he pressed her hand and brushed her face.

Sir John Binghampton burst into the room and became angered at the sight of the two lovers. He challenged Harold to a duel. They fiercely assaulted each other.

Finally Sir John gave up the match and bathed in tears he left the room.

Harold threw down his arms and searched his darling's face.

"Come, Anne, my love. Nothing can stand between us," he whispered.

He led her from the room.

Triteness and conventionality, however, are not always characteristic of teen-agers, as is shown in the following poems written by three Camp Fire Girls. One of the objectives of this organization is to stimulate and develop the creative ability of its members.

I JUST WONDER¹⁰⁸

I just wonder, God
If sometimes You don't tire
Of comforting other people's woes,
Of listening to their trouble, and
On hearing their sorrow, say,
"Why did I do that?
Why did I make that great troublesome world?"
God, I sometimes wonder.

God, I sometimes wonder
If You don't get bored
By the wants of us poor fools on earth,
Don't You rebel at hearing
The foolish things we ask for,
Money, power, strength?
God, I sometimes wonder.

God, I sometimes wonder
Couldn't You ever take some time off,
And just lay Your head in one of the angel's laps,
And let her rub it,

¹⁰⁸ Reproduced by permission of Camp Fire Girls, Inc., New York.

And tell her some of Your troubles?
I think it would help.
God, I just wonder!

Lida Walker
Age: 14

I MUST NOT HURRY¹⁰⁴

I must not hurry along this road,
There is too much to see;
A crimson flower, a wrinkled toad,
A knotty, scarred oak tree
A bubbling brook, a lacy fern,
A cobweb, shimmering still.
A yellow bird whose mournful notes
Sound over vale and hill.
Because all nature's loveliness
Is very dear to me,
I must not hurry along this road,
There is too much to see.

Betty Jane Soule
Age: 13

Of course, we cannot expect *all* adolescents to reach the quality of creative writing represented by the two poems just quoted. The important point is, however, that many do possess creative ability which, if developed, would give them much personal satisfaction. Greater opportunities for creative writing should be provided both in high school and in college with more emphasis upon individual achievement in relation to ability. Much potential spontaneity is killed by too frequent insistence upon the preparation of a specified number of themes, and the grading of all these according to a set of fixed standards.

As many progressive teachers are realizing, we should not wait until the upper grades and high school before we attempt to develop creativity. Instead, the encouragement of freedom and spontaneity of expression should begin in the preschool and early school years.

THE FROGGY¹⁰⁵

A little fat, green froggy
Was sitting in the sun.

¹⁰⁴ Reproduced by permission of Camp Fire Girls, Inc., New York.

¹⁰⁵ Reproduced from *Poems by Camp Fire Girls*, copyright, 1948. (By permission of Camp Fire Girls Inc., 16 East 48th Street, New York 17, New York.)

Catching little buggies
On his dart-like, little tongue.

He saw his dainty lady-love,
Go hopping quickly by,
And when she turned and smiled at him
He winked his bright green eye.

When the little, fat, green froggy
Saw the sun was sinking low,
He put on his little night-cap
And tied it in a bow.

He got down on his froggish knees
And a little prayer he said,
Asking for more bugs to eat;
And then he hopped in bed.

Lois Rummerfield
Age: 13

Sometimes the child who apparently is inarticulate can learn to express himself under the guidance of an understanding and patient teacher. This is illustrated by the case of a retarded boy who had difficulty in expressing himself. One day he brought his teacher the following poem about spring:¹⁰⁶

I like spring
It is cool.
The trees are like kites
In the sky.
I like spring.

The child explained that he wanted to use the word "air" in his poem, but did not know how to spell it. After the teacher talked with him about why he liked spring, he revised his poem, thus:

I like spring
The air is cool,
And the trees are like kites
In the sky.
The birds sing a song to me
And I feel happy.

¹⁰⁶ From M. E. Bowers, "The Pictures in His Mind," *Childhood Education*, 1947, 23:218-220. (By permission of the publisher, The Association for Childhood Education International, 1200 Fifteenth Street, N.W., Washington 5, D.C.)

Later he wrote another poem about a horse plowing, which showed still further improvement:

I like to see a horse
Pulling a plow,
When he gets hot,
Steam comes out
Like smoke.

After the teacher helped him to put into words the pictures he had in his mind, this poem became:

THE HORSE PLOWING

I like to see a horse
Pulling a plow,
With his head bowed
And his feet digging
Deep in the ground
When he gets hot
The steam comes out of his nose
Like smoke.

In our discussion of art, music, and writing, the three major avenues of creative activity, we have seen that most individuals can express themselves in one or more of these media if stimulating opportunities are provided. In all aspects of creative productivity the present trend is to emphasize the free and spontaneous expression of personality, and the enjoyment to be gained from such experiences. Technical skills are essential, particularly for those of special talent, but for the majority they are now regarded as secondary in importance to spontaneous expression.

SUMMARY

Art, music, and writing are valuable as media of self-expression for children and adolescents, and reflect different stages in their development. Analyses of drawings and paintings made by children and youth reveal many interesting facts about the development of visual perception. They also throw considerable light upon certain emotional and social adjustment problems.

In studying children's drawings the biographical and cross-sectional methods have been employed most frequently.

Children show definite preferences for drawing certain objects, the

favorite being the human figure. These representations usually are crude, incomplete, and out of proportion. Composition or situation drawings occur, as well as the portrayal of single objects.

Development in drawing seems to follow a definite sequence, although there is much overlapping among individual children in the "manipulative," "symbolic," and "realistic" periods.

The critical attitude toward creative work which develops during preadolescence continues into adolescence, where it reaches a climax. Despite this, most adolescents like to draw for their own amusement. An analysis of such drawings shows that slogans and slang expressions printed in a decorative manner are the most popular subjects, while the human figure ranks third.

Finger painting is a relatively new medium for self-expression which holds much promise for the encouragement of freedom and spontaneity in the art of both children and adults. Some authorities, however, feel that its possibilities are limited.

There is some disagreement as to when children should be introduced to water colors. They are valuable for stimulating the imagination of older children and adolescents but are unwieldy for young children.

Color preferences arise about the third month of life and become marked between 6 and 15 months. Red and yellow, which are preferred then, are replaced by adult preferences, blue and green, upon school entrance. Although there may be little relationship between color vision and artistic ability, colors which children use are influenced by their emotional experiences.

There is some relationship between the sequence in drawing and intellectual development, and the ideas expressed in the drawing of a man have been so standardized as to provide a rough measure of a child's intelligence. This scale is not suitable for older children because their representations are influenced too greatly by school experience.

Art may serve as a means for releasing emotional tension in children and adolescents. Frequently their drawings and paintings provide clues to situations which are hampering their emotional adjustment.

Some form of musical expression occurs very early in the child's development. There is no agreement on the relative contributions of heredity and environment to the production of musical talent. How-

ever, available evidence indicates that musical ability consists of a number of specific capacities which are largely inherited. Objective measures of musical talent have been developed but are as yet too complex to be used effectively for small children. They also measure the sensory rather than the appreciative side of music.

It has been claimed that the child's musical development follows definite sequences, but these probably are affected by individual differences.

Experiments have shown that babies as young as five months can be taught to "sing" simple melodies. There is some evidence, also, that the early spontaneous singing of children follows a recognizable pattern. Performance in singing may be improved greatly through controlled practice, with an accompanying increase in enjoyment. Singing should be made a natural part of classroom activity, guided by the regular teacher rather than by a specialist. Interest in the songs sung in school declines as children grow older, and many other types of songs take their place.

Spontaneous singing decreases with the coming of adolescence, because of heightened self-consciousness. It is affected, also, by social interests.

Rhythmic activity is spontaneous with children, although their ability to "keep time" is inferior to that of adults. This ability improves with maturity but is not helped much by training. After adolescence dances and games form the chief means of rhythmic expression, and eventually social dancing is most popular.

The present emphasis in teaching instrumental music to children is upon enjoyment rather than upon accomplishment. There is little agreement as to what instruments or what techniques should be used or when they should be employed. The ability to play a musical instrument often helps an adolescent to achieve status with his peers or to gain access to a group which otherwise might be closed to him.

By creative writing we refer to the unique way in which one expresses his thoughts and feelings and conveys them to the reader with vividness and charm. Although it is doubtful if most people can achieve literary fame, many could be taught to write more interestingly, and thus gain greater pleasure.

Opportunities for spontaneous expression should be given early in the child's development, and considerable improvement can be effected if he can have patient and understanding guidance.

To some extent the triteness and formality of adolescent writing reflects the desire for conformity characteristic of this period. Outstanding exceptions show, however, that adolescents can produce works of literary merit.

We have now concluded our survey of growth and development during the first two decades. Obviously, it has been impossible to give detailed consideration to *all* aspects of so complex a subject. We have sought, however, to present a general picture of the developmental processes in the hope that the reader may gain greater understanding of how these processes operate in the behavior of any given individual.

SUGGESTED ACTIVITIES

1. Collect some spontaneous drawings of children in the primary grades and identify, if possible, the following characteristics: (a) ornamentation, (b) stylization, (c) transparency, (d) proportion, and (e) attempts at perspective.
2. Collect some spontaneous drawings from high school and college students, and contrast them with drawings made by children in the primary grades. Note if the same differences appear as those described in your text.
3. Secure permission to visit a kindergarten class where finger painting is in progress. Report your observations to the class, explaining whether or not this medium is suitable for small children.
4. Visit a high school or college art class and determine, if possible, whether the teacher stresses art as a means of emotional expression or as one of visual representation.
5. Appoint a committee of those familiar with musical notation to listen to and record the spontaneous "songs" of several preschool children. Note if their motif conforms to that suggested in your text.
6. Ask your instructor to arrange for the administration of the Revised Seashore Musical Talent Tests. Discuss your performance from the standpoint of your potential musical ability.
7. Collect the song preferences of middle- and lower-grade children similar to those in Boynton's study, and check your results with his findings as summarized in your text.
8. If possible, visit a modern kindergarten and observe the different ways in which children interpret rhythm.
9. Collect some samples of poems and stories dictated by preschool and primary-grade children. Discuss these from the standpoint of rhythm, imagery, and directness.

10. Examine some examples of English themes written by adolescents and note instances of triteness and lack of spontaneity. Note, also, any evidences of originality or literary merit.

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